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Policies and Perspectives

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ISBN 9784899742159 (Print)
ISBN 9784899742166 (PDF)

Note: In this publication, "$" refers to US dollars.

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Foreword

Many countries in the world are experiencing rapid demographic changes, with varying degrees, toward population aging due to lower fertility rates and longer life expectancy. Several countries are already facing a decline in population. This global trend is envisaged to have far-reaching impacts on the economic and social landscapes of national, regional, and global economies.

The implication of demographic changes and/or an aging population is increasingly extending across the global economy. Its impacts are not limited only to developed economies, as developing economies are also starting to see more evidence of change. They range from a shrinking working population while the number of retirees increases, threats on sustainability of fiscal institutions, efficacy of macroeconomic policies, rising inequality, high labor force informality, and other socioeconomic challenges.

The Group of 20 countries are increasingly exposed to the impacts of population aging. The impacts can be distinguished based on the stages of demographic change. In the aged and fast-aging economies, this threatens the sustainability of fiscal institutions, including conventional tax design and pay-as-you-go pensions, and the efficacy of conventional macroeconomic policies, indicating that structural reforms will be required. In the still younger economies, aging in conjunction with technological diffusion, rising inequality, high informality, and rapid regional migration render policy formulation extremely challenging. To address the relevant Sustainable Development Goals, policies, which deliver social protection to those who need it while delivering macroeconomic integrity to maintain employment and a financing base for social protection, should be developed and pursued.

In clear recognition of an increasing role of demographics on domestic and global policy agendas, Group of 20 policy makers are reminded to thoroughly identify social and economic impacts arising from the rapid demographic transition. As in response to such phenomena, appropriate policy measures and actions need to be designed toward sustaining inclusive economic growth and developing well-functioning socioeconomic systems that provide economic security to all people. Consequently, five related areas are identified under the work of the Think20 (T20) Task Force on Aging Population and its Economic Impact + Immigration (TF10). First, taking into account the different stages of demographic transition, macroeconomic impacts and the responsive policies in an aging society must be discussed. The second area covers labor market reforms for better-managed and more efficient labor markets with favorable labor-market conditions in the face of rising population aging. Third, to maintain and/or improve fiscal sustainability in an economy, policy measures to ensure long-term fiscal sustainability and adequacy of social security systems must be developed. Fourth, a proposal is made to explore a role of immigration in offsetting the impacts of population aging; thus, designing immigration policies to support an aging population is included. Lastly, population aging would require further financial market innovation and development as a variety of financial instruments are needed to help raise long-term saving and investment and manage longevity risk; the role of the financial industry and international capital flows must be determined for this impact.

This T20-associated publication gathers the policy briefs contributed by the co-chairs and the members of the T20 TF10. We hope the policy recommendations included here will benefit a design of policy frameworks that address policy necessity to cope with the demographic transition at both the domestic and global interfaces.

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Lead Co-chair of Task Force 10: Aging Population and its Economic Impact & Immigration

Abbreviations

CEPAR	Centre of Excellence in Population Ageing Research
EITC	earned income tax credit
EU	European Union
FDI	foreign direct investment
G20	Group of 20
GDP	gross domestic product
IMF	International Monetary Fund
KLoSA	Korean Longitudinal Study of Aging
MBR	Made by Refugees
OECD	Organisation for Economic Co-operation and Development
PAYG	pay as you go
PISA	Programme for International Student Assessment
PRC	People's Republic of China
ROK	Republic of Korea
SDG	Sustainable Development Goal
T20	Think20
TEPAV	Economic Policy Research Foundation of Turkey
TFP	total factor productivity
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
US	United States

Acknowledgments

This publication is the outcome of a collective effort. During 2019, the networks of think tanks have been actively involved in the T20 process. This publication reflects their hard work, commitment, and value contribution to policy dialogues.

We would like to express our deep appreciation to the co-chairs and the members of the T20 Task Force on "Aging Population and its Economic Impact + Immigration": Pitchaya Sirivunnabood, Asian Development Bank Institute; Jeong Pyo Choi and Taesuk Lee, Korea Development Institute; John Piggott and Rafal Chomik, ARC Centre of Excellence in Population Ageing Research (CEPAR); Andrew Mason and Sang-Hyop Lee, East–West Center, University of Hawaii; Andreas Esche and Martina Lizarazo-Lopez, Bertelsmann Foundation, Germany; Güven Sak, Economic Policy Research Foundation of Turkey (TEPAV); Charles Yuji Horioka, Kobe University; Yoko Niimi, Doshisha University; Konosoang Sobane and Wilfred Lunga, Human Sciences Research Council; Seung Hyun (Luke) Hong and Tanyasorn Ekapirak, ASEAN+3 Macroeconomic Research Office (AMRO); and Agustin Redonda, Council on Economic Policies.

We would also like to thank David Hendrickson and Adam Majoe for their valuable efforts to produce this publication.

About the T20

The T20 is one of the G20's engagement groups, where representatives of different civil society stakeholders take their demands and proposals to G20 countries. It gathers think tanks and leading experts from around the world to produce concrete policy recommendations. During 2019, the T20 was co-chaired by the Asian Development Bank Institute (ADBI), the International Institute for Monetary Affairs (IIMA), and the Japan Institute for International Affairs (JIIA).

More information at: https://t20japan.org.

Introduction

Aging is a global phenomenon that will persist for the foreseeable future. Before the early 1970s, the populations of many countries were getting younger as improvements in child survival rates in the developing world led to high concentrations at younger ages. In many developed countries, a significant increase in the birth rate (known as the baby boom) following the end of World War II led to young populations as well. Since the early 1970s, however, the share of children in the population has been in decline. A dramatic increase in the working-age share, known as the dividend phase, has dominated the demographic scene for many decades and will continue to do so for decades to come in sub-Saharan Africa. In high-income countries, the dividend phase is over and, in many emerging economies, the dividend phase will soon end. The share of the working-age population and, in some countries, the absolute numbers in the working-age cohort is in decline.

Globally, the share of the population at older ages is increasing at a faster pace than ever before. However, the extent and speed of aging varies considerably around the world. Aging is furthest along in Japan and in many European countries including Germany, Italy, and Spain. In the future, low fertility and high life expectancy will lead to rapid aging in Eastern Europe, East Asia, and Southeast Asia.

Aging raises many important policy issues, but it should not necessarily be looked at as an economic problem. Aging is a consequence, in part, of the remarkable gains in life expectancy, arguably the most important feature of development during the 20th century. Aging reflects a shift from high fertility and low education to low fertility and high education. Working-age cohorts are smaller in number but more educated and productive. Aging may lead to capital accumulation with favorable implications for labor productivity. Aging may have favorable consequences for the international economy by increasing the demand for foreign workers and the supply of foreign investment by high-income countries. These are some of the possibilities are explored in this report.

Aging is presenting new and important challenges that bear on how successfully the Sustainable Development Goals are met over the coming years. Three major themes encompass the work presented in this collection of policy briefs and in discussions held at the Think20 (T20) Summit and its associated events. First, aging will require structural reforms that promote economic growth, macroeconomic integrity, and a resilient labor market. Second, social protection systems must be reoriented to emphasize poverty alleviation, wealth accumulation, adequate social security for all, and fiscal sustainability. Third, an effective response to aging requires the development of data systems, policy tools, and analyses pertaining to the impacts of demographic changes in the Group of 20 (G20) countries and emerging economies outside the G20.

In the first policy brief, "Macroeconomic Impacts and Policies in Aging Societies," Andrew Mason and Sang-Hyop Lee ask whether population aging will lead to an economic crisis with tepid economic growth, generational inequality, unsustainable public finances, and overly burdened families. They argue that countries with moderate population aging can pursue successful policies that will capitalize on the benefits and minimize the costs of population aging. Countries with very low fertility and severely aging populations will likely face serious economic problems.

Several policies are proposed to achieve economic success. First, they emphasize the need to improve national statistical systems to include comprehensive economic data by age, gender, and income class. Effective use of these data systems will require enhanced national capacity to access, utilize, and analyze them. Second, they point to the importance of maximizing demographic dividends influencing economic behavior over the life cycle, encouraging capital accumulation and investment in education, and population policies that support family

building. In aging societies, generational and gender equity are of particular concern. Public policies must seek a balance between spending on children, seniors, and prime-age adults and seek to acknowledge and support women's full contribution to national economies, including the contribution through unpaid family work.

Andreas Esche, Martina Lizarazo López, and Thieß Petersen, in "Fostering Prosperity: Investment and Demographic Transition," emphasize the important role of investment in aging societies. As slower growth in the working-age population threatens to undermine gross domestic product (GDP) growth, stepping up domestic investment can help increase labor market participation, labor productivity, and total factor productivity. Moreover, international capital flows from aging societies, i.e., developed economies, can contribute to economic and social progress in developing economies with young age structures, potentially yielding a stronger first demographic dividend.

In aging societies, key steps can be taken to increase employment. The reform of pension entitlements would help extend work life. Active learning, vocational training, and policies that will help maintain good health would all help older workers maintain their productivity in the later years of their lives. The recruitment and integration of skilled immigrant workers would complement the economic contribution of domestic workers.

The increased availability of resources in aging societies will serve to boost labor productivity in developing countries by funding education and training programs and investing in transport, telecommunications, and water and energy supply infrastructure.

Naoyuki Yoshino, Chul Ju Kim, Pitchaya Sirivunnabood, in "The Aging Population and Its Impact on Fiscal Sustainability," emphasize the multifaceted ways in which the economy will be influenced by demographic change. Features of the economy that require attention are its fiscal balance, saving and investment, labor supply, the welfare system, productivity and economic growth, and the effectiveness of macroeconomic policy. In their brief, they propose recommendations calling for comprehensive structural reforms for improving the quantity and quality of the labor force, public finance reform on both the revenue and expenditure side, and thorough attention to public and private pension schemes.

Issues that should be addressed with public pensions include raising the retirement age, increasing contribution rates, adjusting compulsory government subsidies, and abolishing unjustified benefits. For some governments, funded or partially funded pension systems may be attractive because, if well managed, they are sustainable and they contribute to national savings, investment, and growth. More countries should explore the potential for private sector pensions, with government initiatives such as tax incentives or other subsidies to pursue progressive reforms.

Agustin Redonda, Vincenzo Galasso, Mark Mazur, Miranda Stewart, and Matthew Whittaker, in "Taxation in Aging Societies: Increasing the Effectiveness and Fairness of Pension Systems," provide one of several important contributions to public sector reform needed in aging societies. In many countries, the redesign of pension systems has become a priority. Sustainable public pension programs depend on taxation with its important influence on behavior, such as pension savings and employment. Progress in the design of pension systems has been made but much remains to be done to increase the effectiveness and fairness of pension systems. Thus, the authors urge G20 governments to take a systemic view of pension systems including socioeconomic aspects such as education, migration, and labor force participation and informality. Moreover, governments should take into account the distributional impact of tax policies for pension savings.

In their recommendations, they emphasize the importance of balancing equity and sustainability in the design of pension systems, particularly in light of the informality that characterizes many labor markets. They also emphasize the importance of attention to the distributional impact of tax policies for pension saving and policies that advantage seniors as compared to families of working-age adults.

One of the most widely discussed policy responses to population aging is to encourage older adults to work longer and retire later. Economists are just beginning to quantify whether older adults are indeed in a position to work to an older age. In their policy brief, "Work Capacity and Socially Sustainable Public Pension Systems in Aging Societies," Junghyun Kwon, Taesuk Lee, and Serena Rhee undertake important research on the prospects for greater work effort on the part of older adults in the Republic of Korea that are comparable to similar findings in the United States. They also caution that health inequality leads to inequality in work capacity. Because of this heterogeneity, good public policy is a challenge. They propose increasing the pensionable age slowly, providing flexible benefit options, complementing pension reforms with other welfare programs, boosting the demand for older workers, and improving work environment safety.

In their policy brief "Aging, Fiscal Sustainability, and Adequacy of Social Security Systems," Rafal Chomik, John Piggott, and Gaoyun (Sophie) Yan point out the distinctive features faced by developed and developing countries. Many developed countries have well-established and expansive systems that will require reform to balance spending and revenues. Most emerging economies are still establishing comprehensive retirement income support structures, universal health services, and publicly supported long-term care in a rapidly changing macro-demographic environment.

In line with the Sustainable Development Goals (SDGs) of the United Nations (UN), this policy brief recommends that social security reforms emphasize non-contributory pension programs that provide much-needed safety nets for older people. These will be the most important structures to deliver the SDGs, especially for emerging economies.

The authors recommend a system of social security for seniors that includes a strong first-pillar pension, universal health care, and long-term care policies. Those who can afford to save for retirement should be required to do so, through a contributory earnings-related retirement structure, either unfunded or pre-funded. Depending on the stage and rate of change of the demographic structure, sustainability may require transition to pre-funding. Wherever possible, both first- and second-pillar pensions should be designed in a way that encourages labor force participation across the age distribution to maintain macroeconomic integrity.

Seung Hyun (Luke) Hong and Tanyasorn Ekapirak, in their chapter "Supporting Sustainable and Effective Social Security System Development in Aging Developing Countries", urge the G20 members to (i) to support the development of a framework for developing countries that will help them assess the effectiveness and efficiency of their systems, and (ii) provide technical support to developing countries in developing and implementing their own medium- to long-term frameworks.

Aging can happen very fast in developing countries, which have experienced sharp drops in fertility and rapid increases in mortality. Social security systems are non-existent or relatively undeveloped. These countries face temptation to introduce unsustainable programs. Less-developed economic and financial institutions make it more difficult for people to provide for their own needs in old age. Family support is waning. In light of these conditions, it is critical to develop and implement equitable and sustainable programs to meet old-age needs.

According to Omar Kadkoy and Güven Sak, in "The Role of G20 in Designing Immigration Policies to Support Population Aging," immigrants provide a potentially important contribution to the economy of the destination economy. As immigration increases in importance, it is essential to develop training policies and programs that reflect the heterogeneous nature of today's immigrants. Immigrants are both low- and high-skilled, economic migrants and forcibly displaced, men and women, single and members of families. To realize successful immigration programs requires training programs that are tailored to the talents of immigrants and the needs of the countries to which they have moved. Establishing Made by Refugees special economic zones should improve the contribution of refugees and reduce the exploitation to which they are sometimes exposed.

Wilfred Lunga and Konosoang Sobane, in "Investment in Social Capital and Migrant Labor as a Labor Policy Alternative in Countries with High Population Aging," emphasize the need for comprehensive policy actions that integrate internally oriented and externally oriented solutions such as the revision of migrant labor and tap into social capital policies. The policy recommendations are proposed in two main areas of (i) cost management associated with aging through favorable investment policies in social capital networks of migrant labor, and (ii) planning through a social capital lens by using all available talents or resources to promote the inclusion of women, the elderly, youth, and foreign workers in the labor market. The chapter also highlights envisaged benefits of incorporating foreign labor in a local labor market given their diverse skill sets.

Charles Yuji Horioka and Yoko Niimi, in "Financial Literacy, Incentives, and Innovation to Deal with Population Aging," point out the importance of saving for old age in the face of population aging. While individuals are increasingly being asked to take more responsibility for their old-age saving, low levels of financial literacy are prevalent across the world. Moreover, financial incentives that encourage saving are not widely used and have limited impact where they are used. The authors propose the following policies to address this important issue. First, governments should ensure that people have an equal opportunity to access financial education at a young age. Second, governments should pursue concerted and coordinated efforts among the authorities responsible for education, financial regulatory authorities, and the private sector (financial institutions) to develop appropriate financial education programs. Third, governments should encourage research to improve the design of financial education.

Governments should also improve the design of financial incentives to save for retirement by introducing pension plans with automatic enrollment and automatic escalation of contributions. They should offer financial incentives that are simple and stable. Finally, governments should encourage the development of financial products, education, and assistance to those who are drawing down resources to support their old-age needs. Attention to those with impaired cognitive skills should be a priority.

In the light of rising population aging, the members of the T20 Taskforce on Aging Population and its Economic Impact + Immigration are committed to policy recommendations that address the relevant SDGs while delivering macroeconomic integrity to maintain sustainable economic growth. We believe that our work will contribute to a fruitful discussion among the G20 leaders, resulting in wide-ranging benefits for economies and the global economy.

Macroeconomic Impacts and Policies in Aging Societies*

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Abstract

Will population aging lead to an economic crisis with tepid economic growth, generational inequality, unsustainable public finances, and overly burdened families? Answering these questions definitively requires data and analysis that have not been available in many countries. The evidence that is available, however, indicates that countries with moderate population aging can pursue policies that will capitalize on the benefits and minimize the costs of population aging. Countries with very low fertility and a severely aging population will likely face serious economic problems.

Challenge

Population changes around the world are having a profound effect on macroeconomic prospects. Other things being equal, an increase in population at the most productive ages leads to an increase in per capita income, while an increase in population at the least productive ages leads to a decline in per capita income (Bloom and Williamson 1998). In roughly half of the countries of the world, mostly lower-income countries, the highly productive population share has been increasing, accelerating economic growth—a phenomenon known as the first demographic dividend. The remaining countries, mostly higher-income countries, have moved to a new demographic phase which features a declining share in the working age, a negative first demographic dividend, and population aging.

Effective policies can lead to a second demographic dividend, however, which sustains economic growth in countries that are experiencing moderate population aging. The second dividend occurs as demographic change leads to greater physical and human capital and, as a result, to higher productivity (Mason and Lee 2007).

The purpose of this policy brief is to propose concrete steps that will improve understanding of the links between population change and economic growth, and promote growth and reduced inequality in an aging world. First, countries should improve the availability and use of data that explain the generational economy. Current policies are excessively reliant on overly simplified data that ignore how economic outcomes and behavior vary across generations. Second, policies should be designed and implemented that capitalize on demographic dividends, both in countries that are enjoying the first demographic dividend and countries that

* The authors appreciate the useful suggestions provided by Ron Lee, Gretchen Donehower, Sidney Westley, and participants in the task force.

are dominated by population aging. Third, policies must address generational and gender differences that undermine efforts to improve growth and reduce inequality.

Proposal

Policies: Improve Data and Analysis on Population and Economic Links

Policy 1: Extend national statistical systems to include comprehensive economic data by age, gender, and income class.

Policy 2: Enhance the national capacity to access, utilize, and analyze economic data by age, gender, and income class.

Members of different generations face different economic challenges and policy priorities. Traditional economic analysis, however, ignores generational differences or treats them in a highly stylized fashion. For example, many economic models assume that people fall into three discrete groups: children, typically those under age 15; working-age adults, those 15–64; and seniors, usually those 65 or older. Although child dependents are defined as children, intergenerational transfers to support young people in their late teens and twenties are substantial in many countries. And although seniors are said to be dependents, many continue to work and contribute to national wealth and capital accumulation.

Understanding the generational economy and how economic resources are allocated and used across generations is critical for effective policy responses to changing population age structure. Intergenerational flows to children and young adults are dominated by public and private transfers, but the mix of the two varies considerably. Intergenerational flows to seniors are dominated by public transfers in many countries. In other countries, however, public transfers play almost no role because seniors rely primarily on their own assets to meet their material needs.

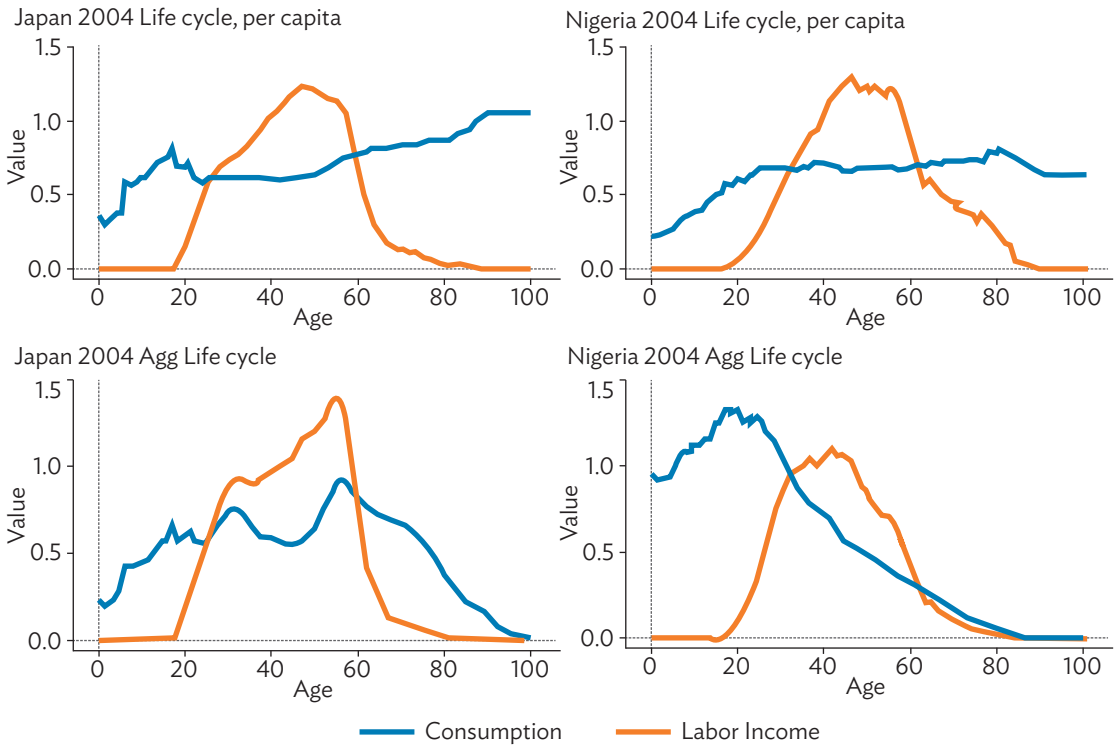
New tools have been developed that shed light on the generational economy. Quantifying the economic life cycle is one important building block, illustrated by estimates for Japan and Nigeria (Figure 1). In the upper panels, per capita labor income and consumption of 1-year age groups are plotted relative to the average values of those in the 30–49 age range. This measure emphasizes the differences in the age patterns of labor income and consumption, while controlling for differences in the levels of economic development.

Japan and Nigeria are similar in important ways, but their differences are instructive. In Japan, and in high-income countries in general, children and seniors have large per capita life cycle deficits. High deficits for children reflect strong commitments to education leading to high consumption and low labor income at early ages. High deficits for seniors reflect extended periods of retirement and high spending on health care. In Nigeria, and in most other lower-income countries, the per capita life cycle deficit for children and seniors is relatively low. Spending on education and health are relatively low, and formal retirement is unavailable in many of these countries.

Aggregate flows, shown in the lower panels of Figure 1, incorporate the effects of population age structure on the life cycle. Japan has a very old population and, hence, a large old-age deficit. Nigeria has one of the youngest populations in the world with a very large deficit at young ages and a very small old-age deficit.

Life cycle deficits are funded through various mechanisms. Public intergenerational transfers support children and seniors by relying on taxpayers, while private intergenerational transfers rely primarily on families. Young adults and seniors may rely heavily on capital (including debt) to generate resources needed early and

Figure 1 Consumption and Labor Income by Age, Japan and Nigeria, 2004



Agg = aggregate.
Note: Per capita and aggregate values, respectively, are expressed relative to the simple average of per capita and aggregate labor income in the 30–49 age range.
Sources: Lee and Mason (2011), National Transfer Accounts database. www.ntaccounts.org (accessed 18 January 2019).

late in life. The macroeconomic effects of population aging depend heavily on the balance among these funding mechanisms in specific countries. Funding mechanisms influence public finances, saving and capital accumulation, generational equity, and the private cost of fertility and childrearing.

At older ages, the approach to funding the life cycle deficit varies considerably judging from estimates available for 28 economies (Figure 2). The economies fall into three distinctive clusters depending on their public support for seniors. Seven countries have low public support for seniors—Cambodia, El Salvador, India, Indonesia, Philippines, South Africa, and Thailand. In these countries, net public transfers are typically near zero and never exceed 20% of the old-age deficit. In eight economies—the People's Republic of China; Japan; the Republic of Korea; Taipei,China; Australia; Mexico; the United Kingdom; and the United States (US)—public support for seniors is moderate, with net public transfers to seniors ranging from 36% to 57% of the old-age deficit. In 13 countries—Austria, Brazil, Costa Rica, Ecuador, Finland, France, Germany, Hungary, Italy, Peru, Slovenia, Sweden, and Uruguay—net public transfers are higher, ranging from 63% to 114% of the old-age deficit (Mason and Lee 2018).

Seniors who live in economies with limited public programs can turn to their families for support or they can rely on assets accumulated when younger. Family support is still important in some East Asian economies, but it is declining. Outside East Asia, seniors are providing as much economic support to family members as they

Figure 2 Public Transfers, Private Transfers, and Asset-Based Reallocations as a Percentage of the Life cycle Deficit for Persons 65 and Older in 28 Economies

Notes: Values are simple averages of values for economies in each group.
Source: Mason and Lee (2018).

receive. Thus, in economies where public support for seniors is low, reliance on assets to fund old age needs is high. In India, for example, asset-based reallocations fund 95% of the old-age deficit, while in Germany and France, where public support is high, asset-based reallocations fund only about 35% of the old-age deficit. The importance of assets to old-age support in India and other lower-income economies is a surprise to many people who may overlook the importance of a small farm or business or the flow of services from an owner-occupied residence.

Data for measuring key features of the generational economy are critical to understanding the economic effects of population aging. A deeper understanding of the generational economy requires better data and analysis of how gender and class inequality interact with public pension systems, labor markets, and family policies. Disaggregating data on the generational economy by these groups will reveal important dynamics. It is essential that national statistical agencies take responsibility for compiling and disseminating these data.

Policies: Maximize Demographic Dividends

Policy 3: Extend and enhance the first dividend phase through policies that influence behavior over the lifecycle.

Policy 4: Realize larger second demographic dividends through policies that encourage capital accumulation and investment in education.

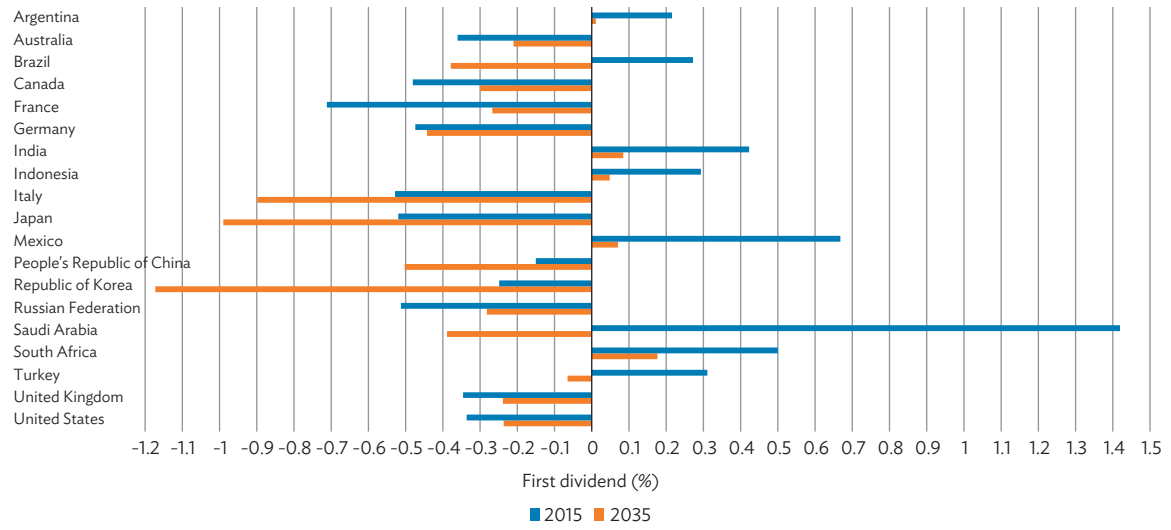
Policy 5: In countries with very low fertility, pursue population policies that support family building.

The first dividend status of the Group of 20 (G20) countries was highly variable in 2015 (Figure 3). In eight countries, the first dividend was contributing to economic growth. The number of effective workers (labor force adjusted for age variation in unemployment, hours worked, and productivity) was growing more rapidly than the number of effective consumers (population adjusted for age variation in public and private consumption). The first dividend was most favorable in Saudi Arabia and Mexico, where the first dividend was contributing at least 0.5 percentage points to per capita economic growth. In 11 G20 countries, however, the first dividend had already turned negative, depressing growth by 0.5 percentage points or more in France, Italy, Japan, and Russia.

By 2035, among the G20 countries, only South Africa is projected to still be enjoying a first dividend that adds economic growth of more than 0.1% per year. In other countries, the first dividend will be negligible or negative. The anti-growth effects arising from the decline in the share of the working age population are projected to be particularly strong in Italy, Japan, and the ROK where very low fertility is leading to rapid population aging.

The first dividend values shown in Figure 3 are computed holding constant the lifecycle patterns of labor income and consumption. The first dividend values will be larger, facilitating higher economic growth, if policies are implemented that increase labor force participation, hours worked, and productivity or reduce unemployment at older ages. Promising policies are those that raise retirement ages, reduce age or gender discrimination in employment practices, promote lifelong learning, increase labor flexibility, and help parents

Figure 3 First Demographic Dividend for G20 Countries, 2015 and 2035



Note: Values are based on projections of the support ratio computed as the ratio of the number of workers (adjusted for age variation in unemployment, hours worked, and wages) to the number of consumers (adjusted for age variation in public and private consumption). The first dividend is equal to the rate of growth of the support ratio.

Source: Mason and Lee (2018).

combine market labor and child-rearing. Likewise, any policies that reduce excessive spending at older ages, e.g., wasteful spending on health care, will enhance the first demographic dividend.

Naturally, many older people would enjoy extended periods of leisure and high levels of consumption, but the institutions and policies governing retirement, pensions, health care, and long-term care were implemented before the costs of aging became clear. The ways health care and long-term care are priced in the US and in some other developed countries are major barriers to controlling the costs of aging.

The political power of older generations often blocks efforts to improve generational equity and fiscal sustainability.

The second dividend operates by raising worker productivity through the connections between the population and physical and human capital accumulation. Assets are accumulated during the working years and, to a surprising degree, remain at relatively high levels after retirement. Seniors rely on income from assets, but do not necessarily reduce their assets as they age. The observed age patterns of total or per capita assets are heavily influenced by higher-income seniors who hold a disproportionate share of national wealth. Aging leads to fewer workers but to more capital and higher productivity. A heavy reliance on public transfers by seniors may undermine capital accumulation by reducing incentives to accumulate private capital on the part of future retirees. In addition, if larger public transfer programs are funded through the accumulation of public debt, private capital may be crowded out.

Countries with very low fertility rates will experience severe population aging. Liberal immigration policies can be helpful, but reversing super-low fertility rates is essential to avoid a top-heavy age structure. Many policies to address super-low fertility are particularly attractive if they provide multiple benefits. Public spending on education reduces the costs of child-rearing and enhances the second demographic dividend. Child subsidies encourage couples to have more children and reduce inequality. Support for young mothers may lead women to have children and reduce barriers faced by women. Policies designed to strengthen the second dividend will help offset the sharp decline in the share of the population at working ages. But even with well-designed policies, public transfer programs will face severe strains and standards of living are likely to grow much more slowly or decline (Lee, Mason, and NTA Network 2014).

Policies: Generational and Gender Equity

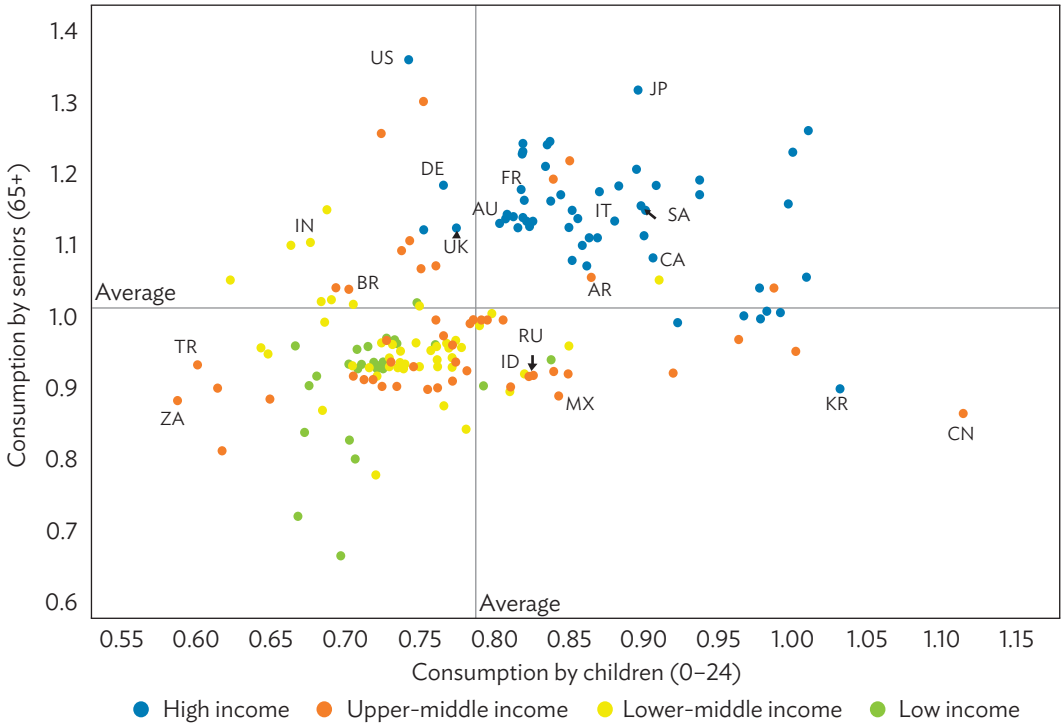
Policy 6: Pursue policies that seek a balance between spending on children, seniors, and working-age adults, with an emphasis on investment in children's education.

Policy 7: Improve understanding and policies that incorporate women's full contribution to national economies, including the contribution through unpaid family work.

For the world as a whole, the average consumption by seniors is essentially equal to the average consumption by prime-age adults. The average consumption varies greatly across generations for individual countries, however. In the US and Japan, seniors consume, on average, 35% more than prime-age adults. At the other extreme, seniors in Mozambique consume 33% less than prime-age adults. As a general rule, seniors in high-income countries have high consumption relative to that of prime-age adults. A notable exception to this generalization is the ROK, where seniors consume only 90% of consumption by prime-age adults (Figure 4).

Expenditures on health care and long-term care are the primary drivers behind high consumption by seniors reflecting both the prices and quantities of goods and services provided. The public sector plays a central role in the health sector in many countries, providing public financing, extensive regulation, and direct provision

Figure 4 Consumption by Children (0–24) and Seniors (65+) Relative to Consumption by Adults Aged 25–64, 180 Countries Classified by Income Group, Estimate as of 2015



AR = Argentina, AU = Australia, BR = Brazil, CA = Canada, CN = People's Republic of China, FR = France, DE = Germany, IN = India, ID = Indonesia, IT = Italy, JP = Japan, MX = Mexico, RU = Russian Federation, SA = Saudi Arabia, ZA = South Africa, KR = Republic of Korea, TR = Turkey, UK = United Kingdom, US = United States.

Note: Consumption by children and seniors is per capita value expressed relative to consumption by persons aged 25–64. Both public and private consumption are included. The G20 countries have been labelled.

Source: Mason et al. (2017).

of health-care services. Thus, high spending on seniors in general and on health care in particular is heavily influenced by public policies.

Consumption by children is also an important generational feature of aging societies. An important concern is that high consumption by seniors will crowd out consumption by children—public resources devoted to pensions and health care for seniors may compete with resources available to children, spending on education in particular. This problem, if it exists, is not evident at high levels of aggregation, however. Developed countries with aging populations also have high spending on children. Note that all but a few high-income countries fall in the northeast quadrant of Figure 4, indicating that consumption is relatively high for both children and seniors. Lower-income countries with young populations fall in the southwest quadrant of Figure 4. Their spending on children and seniors are both low, relative to their spending on prime-age adults.

High spending on children in high-income countries, which tend to have low fertility, can be traced to the quantity-quality tradeoff, i.e., families with few children spend more on each child. Although often discussed as a private-sector phenomenon, the quantity–quality tradeoff is as strong for the public sector. In low-fertility

societies, public spending on education is often high. This is a notable feature of East Asia where education spending is very high and fertility is very low.

The policy implications are complex. If the quantity–quality tradeoff persists, aging societies will have working-age cohorts that are smaller in number but increasingly productive due to enhanced investment in human and physical capital. Because of the investment in education, low fertility leads to a more productive workforce and enhanced economic growth. In this way, human capital and physical capital can both add to the second demographic dividend (Mason, Lee, and Jiang 2016).

Second demographic dividend effects from increased human capital could be even greater if we include a component of production and consumption that standard measures of economic activity often leave out—the unpaid care and household services most often provided by women. Unpaid services—such as cooking, cleaning, and caring for children and seniors—add considerable value both to family welfare and to national economic output.

Measures of economic activity that overlook unpaid care seriously underestimate women's role in national economies, misestimate consumption and production in the generational economy, and hinder good policy design. Policies designed to encourage female labor force participation will have greater success if they address women's existing unpaid care work as mothers and grandmothers. Welfare policy in aging societies should anticipate future increases in demand for family-provided eldercare. Policies to encourage fertility through child subsidies must recognize that in many countries, the value of unpaid care time consumed by young children is far greater than the conventionally measured value of market goods and services (Varga and Donehower 2019). A full accounting of women's economic contribution that includes unpaid care work will lead to policies that promote gender equity and enhance macroeconomic growth.

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Fostering Prosperity: Investment and Demographic Transition

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Abstract

Are aging societies facing lower levels of economic growth and weakening prosperity as a result of a shrinking labor force, lower labor productivity, and growing numbers of pensioners? Stepping up domestic investment can help increase labor market participation, labor productivity, and total factor productivity, thereby counteracting a demographically induced decline in gross domestic product per capita. In the long run, higher levels of foreign direct investment can increase national income and capital stock in aging societies and contribute to economic and social progress in underdeveloped economies with young age structures, potentially yielding a first demographic dividend.

Challenge

Demographic aging affects long-term economic growth and therefore the material prosperity of a society. In all heavily aging developed economies, the number of persons of working age is stagnating or even falling, while, simultaneously, the number of pensioners is rising. The overall employment rate—defined as the proportion of the working population in the total population—is thus on the decline. Under otherwise unchanged economic conditions, material prosperity, as measured by gross domestic product (GDP) per capita, is at risk of declining. To counteract this demographically induced decline in GDP per capita, more domestic investments are needed to increase labor market participation, labor productivity, and total factor productivity. A greater volume of inward foreign direct investment (FDI) can help meet, in the long run, the emerging additional capital requirements of an aging society. Nevertheless, outward investments targeting development in less-developed economies featuring a young age structure could create an already short- to mid-term win–win situation for both investment-origin and investment-target countries. Whereas aging industrialized countries can benefit from the favorable population structure and higher economic growth potential found in these "younger" less-developed economies, the latter could stand to gain from the economic and social progress such investments foster. As a result, in the long term, increased FDI in developing countries could help these countries yield a first demographic dividend. In fact, the balance of FDI is leaning (too) far toward the developed economies, as many developing countries continue to lack the institutional, legal, and technical infrastructure that provide investors certainty.

This policy brief first discusses the areas in which domestic investments in aging societies are needed to increase GDP per capita and therefore promote material prosperity in these countries. It then discusses

whether the different demographic and economic development stages in aging industrial economies and in demographically young, less-developed economies can complement each other in generating long-term economic growth and prosperity for both sides. Finally, it points out which political, institutional, and legal requirements must first be established in order to deliver such outcomes.

Proposal

1. Domestic investments to increase GDP per capita in an aging society

Population aging changes the macroeconomic development of a country through many mechanisms. For one, the ratio of employed persons to persons who are no longer employed because of their age falls. As a result, consumption expenditure tends to increase while, at the same time, investment opportunities in the country decline. Savings accumulation, productivity, and innovative potential also tend to shrink under such conditions. Overall, the situation threatens to usher in a decline in material prosperity.

The key indicator of a society's material prosperity is the GDP per capita (GDP/pop.). The GDP per capita rate depends on the ratio of employed persons to the total population (empl./pop.) and on labor productivity, i.e., the ratio of GDP to employed persons (GDP/empl.). By definition, the following relationship applies: (GDP/pop.) = (GDP/empl.) · (empl./pop.).

In a society affected by demographic aging, the number of persons of working age is stagnating or even falling while the number of pensioners is on the rise. As a result, the overall employment rate—defined as the proportion of the working population in the total population (empl./pop.)—is falling. Assuming labor productivity remains unchanged, there will be a decline in GDP per capita: $(GDP/empl.)^{unchanged}$. (empl./pop.)↓ = (GDP/pop.)↓. For aging societies, in order to prevent a decline in GDP per capita and thus in material prosperity, there are essentially two starting points: increasing the employment rate (empl./pop.) and increasing labor productivity (GDP/empl.).

1.1 Increasing employment through investment

The employment rate in an aging society can be increased if the share of the labor force in the total population grows. Various measures can be applied for this purpose. Depending on a given country's existing labor force potential, these measures can be combined with each other:

(i) **Extend working life** by linking retirement age to the average life expectancy as it increases. This can be done by limiting the general duration of pension entitlements as is the case in Denmark or by introducing a two-to-one rule as discussed in Germany (Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung 2011). Alternatives include introducing more flexible retirement schemes such as that observed in some Scandinavian countries and providing financial incentives for delayed retirement. Although within the Organisation for Economic Co-operation and Development (OECD), 85% of the increased life expectancy at birth are healthy years of life (OECD 2017), it is important to keep the following in mind: any reforms must be accompanied by policies and strategies designed to ensure that older people can actually work in regular employment until they reach retirement age. Alternatively, should these persons not be able to work due to health reasons, social security protections and the mechanisms that enable them must be in place. This involves making the investments needed to establish the appropriate infrastructure for continuous vocational training throughout the entire course of a working life cycle. In addition, it involves ensuring that such infrastructure operates properly and that incentives to take advantage of such training are provided.

(ii) **Increase labor market participation among people of working age who reside in the domestic economy.** This includes in particular women and mothers, family members providing care, persons

with low educational attainment, and immigrants. Public investments targeting the education system, particularly early childhood development and care (Elango et al. 2015), and expanded professional care services for family members requiring nursing care can provide the frameworks needed to improve work–life balance, equal education opportunities, and stronger integration into the labor market. However, in order to provide more professional and high-quality care services, pay and working conditions in these professions must also be improved. Public investments must also aim to achieve these aspects.

(iii) **Increase the influx of skilled workers from abroad** with legislation that creates rational procedures for the recruitment and integration of immigrants and is anchored in a "triple win" concept of migration involving the interests of migrants as well as target and source countries alike (Bertelsmann Stiftung 2015, 2017).

1.2 Increasing labor productivity through investment

GDP per capita can be increased in an aging society if the productivity per worker increases to such an extent that the decline in the employment rate is overcompensated. This increase in productivity can be achieved by enhancing labor productivity:

(iv) In order to increase skill sets and thus human capital over entire life cycles, public investment is needed to improve the education system, in particular, the infrastructure for early childhood development. Tax incentives are also needed to promote continuing vocational training within companies (Cuaresma, Lutz, and Sanderson 2014).

(v) Increasing the productivity of the labor force in an aging society requires higher levels of capital investment. This implies more public and private investments. Public investment, particularly in digital infrastructure, reduces companies' transport costs and increases their productivity (see section 1.3). Private investments can, for example, be promoted by better tax deductibility, for example, by increasing the number of tax deductible items within the sector.

(vi) Investments in technological advancement increase the degree of automation in an economy, total factor productivity (TFP) and thus per capita GDP growth. Acemoglu and Restrepo (2017, 2018) show that a higher degree of automation in aging societies is a decisive factor for economic growth. This requires, for example, the expansion of government-funded basic research and application-oriented research in new technologies as well as better tax deductibility of research and development expenditure in private companies (i.e., expanding the catalogue of tax deductible items).

(vii) Finally, productivity per worker can be enhanced by increasing the working time per worker. Untapped resources for this purpose lie above all in the female workforce, which is employed more frequently than average on a part-time basis (OECD 2018). Leveraging this potential will involve, however, investments in the expansion of child and nursing care (see ii).

1.3 Positive effects of public investment in education, housing, and (digital) infrastructure

Investments that increase both labor market participation and labor productivity are particularly efficient. For Germany, Krebs and Scheffel (2017) have found that increased public investment in education, housing, and (digital) infrastructure can stimulate the labor market in several ways and contribute to an increase in productivity.

Public investment in these three areas generates a significant increase in aggregate output and employment and significantly contributes to the sustainability of public finances. However, investments in education that promote the expansion of high-quality all-day schools and, by additional deployment, significantly

improve the quality of education and care in day-care centers and schools have the most significant effects.[1] These investments increase the educational performance of children and thereby the number of gainfully employed persons with a completed vocational or university degree. This, in turn, has a positive impact on labor productivity and on the number of hours worked by future generations (vii), as better-qualified workers are generally more productive, enjoy full-time employment more often and are less frequently unemployed than are low-skilled workers. At the same time, an improved skills structure in the labor force can also have a positive impact on the innovation potential and thus on technological progress and TFP (vi). The relationship between educational attainment and health status is largely undisputed in the scientific community. People with lower educational attainment have more health problems than better-qualified people (OECD 2017). Accordingly, an improved skills structure in the labor force can be assumed to also have a positive impact on the health status of the labor force and lead to more consistent or longer working lives (i, ii). In addition, the expansion of all-day schools helps parents take care of their children and enables, in particular, mothers who are not gainfully employed or who are marginally employed to take up or expand gainful employment and thus increase their hourly earnings (ii). According to Scheffel and Krebs, investments in education will finally generate a significant increase in aggregate output, as the additional hours worked and the productivity gains from more full-time jobs increase annual GDP. At the same time, the at-risk-of-poverty rate will fall under these conditions.

Investments in public housing development, which increase the affordability of housing in attractive business locations and facilitate access for low- and medium-skilled workers to a labor market with abundant jobs (ii, vii), increase labor productivity gradually. Over time, these investments generate direct output gains and increase annual GDP.

Public investment in transport infrastructure and digital infrastructure reduces transport costs for companies and increases business productivity. As a result, this kind of investment expands individual companies' leeway for private investment (v, vi). The increase in overall economic production is largely driven by the increase in TFP (vi).

Through all three areas of investment, spending on social benefits generally falls, while the employment effects and productivity gains increase public revenues from taxes and social insurance contributions. This in itself would expand the fiscal space needed. Nevertheless, the fiscal burden of aging will require both prudence as well as measures to stabilize the tax base in the long run.

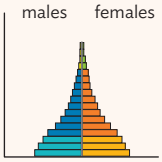
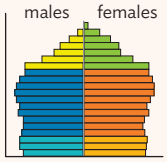
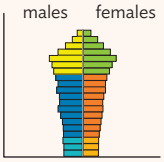
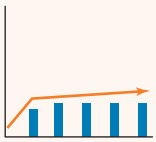
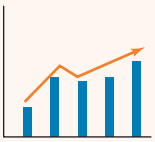
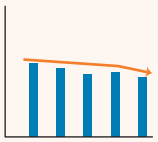
The results show that an aging society can successfully establish the conditions for a second demographic dividend by investing in education and (digital) infrastructure. Such investments in human and physical capital as well as the benefit of the (healthy) years of life gained can increase the productivity of the working population, GDP, and thereby material prosperity – even in an aging society (Mason et al. 2017). At the same time, however, the given pension scheme must also be taken into account and be reformed accordingly.

2. Foreign direct investment: Cultivating a win–win solution for aging societies and "young" developing countries?

The age structure of a population affects key macroeconomic variables such as the labor supply, savings and consumption ratios, or current account balances (e.g., Lührmann 2003, Bertelsmann Stiftung 2010, Yoon, Kim, and Lee 2014, Aksoy et al. 2019) (Figure 1). In the following, we discuss whether the different demographic and economic development stages in aging industrial countries and in demographically young,

[1] Krebs and Scheffel's simulation yielded calculations showing that in Germany, investments in day-care centers and all-day schools with a fiscal return of around 12% achieve significantly higher returns than investments in transport infrastructure and digital infrastructure (around 8%) and investments in housing (around 7%) (Krebs and Scheffel 2017, p. 48).

Figure 1 Age Structure and Macroeconomic Variables

Young Society	Aging Society	Old Society
		
first demographic dividend	second demographic dividend	
• **High** fertility rate • **Short** life expectancy • **High** child dependency ratio • **Low** old-age dependency ratio • **High** total dependency ratio	• **Declining** fertility rate • **Increasing** life expectancy • **Declining** child dependency ratio • **Slightly Increasing** old-age dependency ratio • **Declining** total dependency ratio	• **Low** fertility rate • **Long** life expectancy • **Low** child dependency ratio • **High** old-age dependency ratio • **High** total dependency ratio
		
• **Low capital** stock • **Initially low** but **steadily growing labor supply** (although mostly low-skilled) • **High consumption needs** for children and adolescents • **Relatively low** rate of **production** (due to high total dependency ratio and low capital stock)	• **Increasing capital** stock • **High labor** supply • **High savings** rate (the employed save for old age) • **Low consumption** rate • **High** rate of **production**	• **High capital** stock • **Low labor** supply • **Low savings** rate (pensioners have a low savings rate as well as the employed due to the provision of pensioners) • **High consumption** rate • **Low** rate of **production** due to a low labor supply
		
• Tendential **excess demand** • **Inflationary** tendency • **Limited** investment **opportunities** • **High** investment **requirement** • **Import surpluses** with foreign indebtedness	• Tendential **supply surplus** • **Deflationary** tendency • **High** investment **opportunities** • **Relatively low** investment **requirements** (secular stagnation) • **Export surpluses** with asset accumulation compared to foreign countries	• Tendential **excess demand** • **Inflationary** tendency • **Limited** investment **opportunities** • **High** investment **requirements** (to replace the factor labor permanently with capital) • **Import surpluses** with foreign indebtedness

Source: Own illustration (Population Pyramids cf. https://population.un.gov/wpp/Graphs/DemographicProfiles/).

less-developed economies can complement each other in generating long-term economic growth and prosperity for both sides.

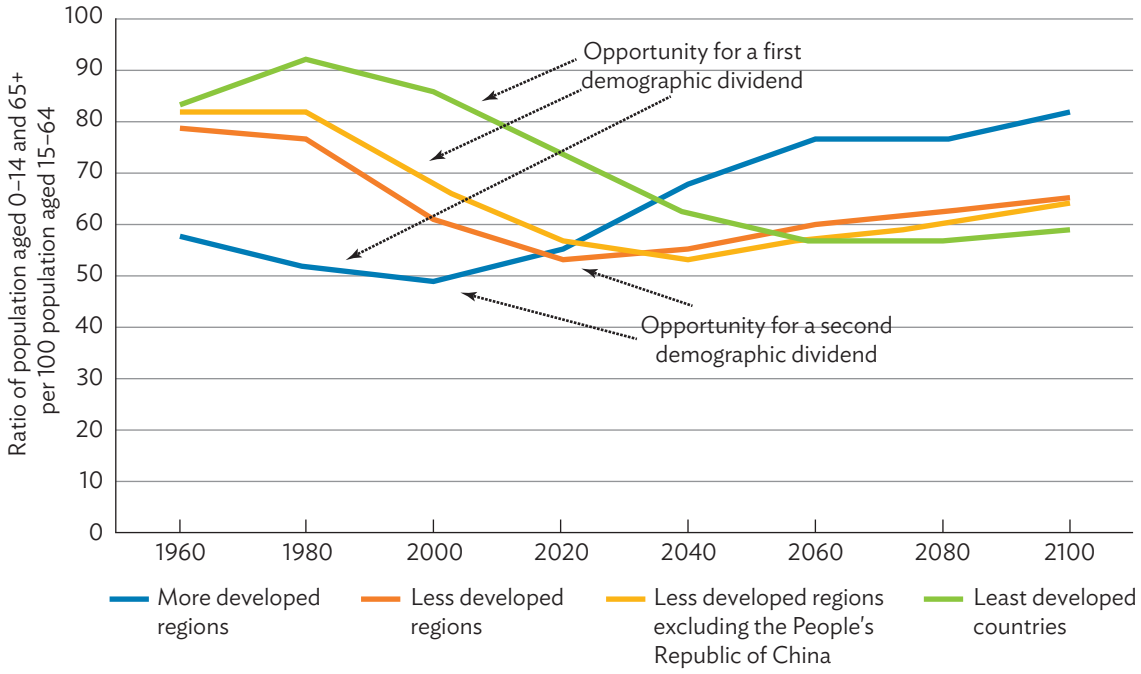
Aging societies can improve the conditions for a second demographic dividend by increasing national income through FDIs. If the demographically "older" country generates export or current account surpluses in a demographically favorable stage, the associated income surpluses can be invested in the rest of the world. FDIs result in capital income that increases the aggregate social income of an old population and thereby the quantity of goods available to that society. However, a return of the capital income or even of the capital invested abroad can only be expected in the long term. As long as the capital-poor developing countries generate a higher return than the capital-rich industrialized countries, the capital remains in the developing countries.

By investing its income surpluses in developing and emerging economies with a young age structure, a growing or large labor force, and higher economic growth potential, an aging society can benefit from the population structure and the economic-development potential. At the same time, these FDIs can help cover the investment needs of young, underdeveloped economies and promote their economic and social development through investments in education, infrastructure, technology, or the labor market (see also Lührmann 2003). If coordinated properly and favorably supported by effective measures to support private investment (e.g., export credit guarantees and investor-state-dispute settlement provisions), this could create a win–win situation for industrialized and developing countries alike.

Most developing countries will also undergo a gradual demographic aging process in the coming decades. However, since over a certain period of time, the child dependency ratio will decline faster than the old-age dependency ratio increases, the total dependency ratio will decline in these countries and the working population will continue to rise. This opens up a "window of opportunity" for a first demographic dividend (Figure 2). In this context, strategic development investments from aging economies can help ensure that these countries have a broader base of (highly) qualified workers in the future. In addition to job creation, FDIs by private companies enable the transfer of technology and knowledge and open up access to international markets (UNCTAD 1996). This can promote the modernization and expansion of economic activity in developing and less developed countries (Görg 2019), thereby expanding the customer base for products from developed economies and helping, in the long run, reduce economically motivated mass migration toward industrialized countries. Aging societies could, on the other hand, recruit well-trained workers from developing countries to better satisfy their demand for skilled labor without draining these economies of a large part of their skilled labor force. Skilled immigrants would, in turn, be presented with genuine access to jobs and/or a career and social inclusion in the industrialized countries. These immigrants can also positively influence the social and economic progress of their origin countries by transferring part of their foreign-earned income back to these countries and by contributing their know-how to local environments upon their return.

To date, experience has shown that FDIs can have these expected positive effects on less-developed countries (for the following remarks, see OECD 2002, Nunnenkamp 2006). Indeed, total productivity and national income increase in the target country because of the higher capital stock and the associated technology transfer. The rising national income is reflected in a higher GDP per capita. The increase in productivity is at its highest in the target country when the technological gap between the target and the source country of direct investments is small enough to support the application of state-of-the-art technologies. The positive effects for the target country outlined above therefore presuppose a minimum level of development, particularly with regard to education and a qualified labor force; infrastructure (transport, energy, legal security, etc.); and technological progress. Already in the 1990s, the United Nations Conference on Trade and Development and the International Organization for Migration published a study finding that FDIs contribute directly to a reduction of migration through job creation in foreign affiliates and in host economies as a whole (UNCTAD 1996).

Figure 2 Total Dependency Ratios and Demographic Dividends



Source: Own illustration. United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision, custom data acquired via website.

Nevertheless, it can also be shown that certain sectors and groups in the target country can lose out as a result of FDIs. In general, it can be observed that in less-developed economies, in particular, the inflow of investments from abroad exacerbates income inequality. This is mainly because these investments generally involve high technology, which boosts the demand for well-skilled workers. As a consequence, the income gap between highly skilled and low-skilled workers grows (Asteriou, Dimelis, and Moudatsou 2014).

2.1 A possible scenario

Insofar as the FDIs of aging societies contribute to the economic development of today's demographically young economies, these recipient economies could then, at a later stage in their demographic and economic development, invest their income surpluses resulting from their current account surpluses in the "old" societies that once invested in them. This is an attractive prospect for recipient economies as they age because old economies, which are characterized by a higher demand for capital and reduction in national savings, will feature rising interest rates (Bertelsmann Stiftung 2010; Yoon, Kim, and Lee 2014; Lührmann 2003), higher returns, and capital income. For old economies, this import surplus would, in turn, mean they do not have to reduce their own capital stock and could instead expand it even further through net investments. The capital intensity of production would thus increase with a positive impact on the average productivity of the old economy's labor force and on GDP per capita. However, investors' entitlement to income payments (interest or capital income) could nevertheless reduce the per capita disposable income in an old society and thereby the material prosperity per inhabitant.

3. What Do We Need to Create a Win–Win Situation?

According to economic theory, capital should flow from developed economies to less-developed countries, as there should be a higher return on capital in developing than in industrial countries. Theoretically, this is due to production technology and basic market economy functions.[2] In fact, however, substantial and growing FDIs have been flowing into developed economies for decades (Lucas 1990). Although inward flows in developing countries have increased significantly in recent decades (UNCTAD 2018), just 2.5% of all direct investments worldwide go to Africa (Görg 2019). Of the approximately €112 billion invested abroad by German companies in 2017, just 0.5% went to Africa, mainly South Africa (Görg 2019). There are rational explanations for this. One explanation, for example, could be that developing countries have in reality no higher marginal productivity of capital because they work with obsolete technologies or do not have the necessary human capital. Another explanation is that the often-unstable legal and political conditions in developing countries create uncertainty among investors who cannot be assured that their capital invested or the capital income generated abroad will be transferred back to their home country. In addition, a weak rule of law in these countries is often accompanied by weak property protections which diminish expectations regarding the return of FDIs (see also Alfaro, Kalemli-Ozcan, and Volosovych 2003).

In order to increase international capital flows from highly developed economies into less-developed economies, which is desirable from a global economic point of view, developing countries must leverage two major mechanisms at their disposal: increasing aggregate economic productivity and strengthening protections against impending capital losses.

1. Boosting labor productivity by improving skills and motivation among the labor force while effectively coordinating education and training with the needs of the economy is an essential first step toward higher productivity. Improving transport, telecommunications, and water and energy supply infrastructures (among others) is also helpful in increasing productivity.
2. Stabilizing the rule of law and clearly defining enforceable property rights are essential to protecting against capital losses. Establishing legal certainty of this nature involves ensuring actionable legal regulations and transparent jurisdiction. Economic and social policies that target macroeconomic stability are also needed to prevent social unrest.

If developing countries succeed in creating these necessary conditions, we can expect international capital flows to align with the theoretical considerations. However, the developed industrial countries also have a duty to contribute to these efforts. The “Compact with Africa” initiative launched under the German Group of 20 (G20) presidency is one example of such an effort. With this initiative, the G20 countries, in cooperation with international organizations such as the World Bank Group, the International Monetary Fund, and the African Development Bank, are pursuing the goal of supporting African partner countries in creating the macroeconomic, politico-economic, and financial conditions to attract private investment (including in infrastructure) to Africa. For this purpose, country-specific reform programs and measures to promote private investments (compacts) are being developed. However, such initiatives must not have the effect that—for example, because of high interest rate guarantees—the least-developed countries are left out in the long term. In order to achieve a sustainable impact or development—also in the sense of the Sustainable Development Goals—infrastructure investments in particular must be coordinated with local economic needs, build on local conditions, and thus promote local entrepreneurship. In the end, the point is that investments “from outside” contribute to an economic dynamic “from within.” This also includes, for example, foreign companies

[2] Because of the relatively low capital stock in developing countries, the marginal productivity of the capital factor is higher than in industrialized countries. Due to the relative scarcity of capital in developing countries, the market price for the capital factor is higher than in industrialized countries.

training local workers, as this is the only way to effect a real transfer of knowledge and to ensure that the local economy benefits substantially from the investments. To expand local markets and thus make them more attractive for investors, the G20 countries could support developing countries in establishing free trade areas. In the shorter term, an extension of government risk-hedging instruments may encourage smaller or "medium-sized" companies to invest in less-developed countries. However, a sustainable willingness to invest can only be achieved if the educational level of the population increases and (government) institutions demonstrate stability. Accordingly, public development aid should primarily benefit those projects that facilitate these objectives. Ultimately, if stable institutions sustainably reduce the risks for investors, companies will invest in these countries even without state protection (Görg 2019).

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The Aging Population and Its Impacts on Fiscal Sustainability

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Abstract

The world is in the midst of demographic change, with varying degrees, toward population aging. Although mixed trends were demonstrated in the Group of 20 (G20) community, it is projected that most G20 economies will experience a significant degree of population aging. The impact of population aging is enormous and multifaceted, i.e., deteriorating fiscal balances, changes in patterns of saving and investment, shortages in labor supply, a lack of adequate welfare systems, particularly in developing economies, a possible decline in productivity and economic growth, and ineffectiveness of macroeconomic policy. This policy brief proposes policy recommendations, covering comprehensive structural reforms, public finance reforms, and reform of public and private pension schemes.

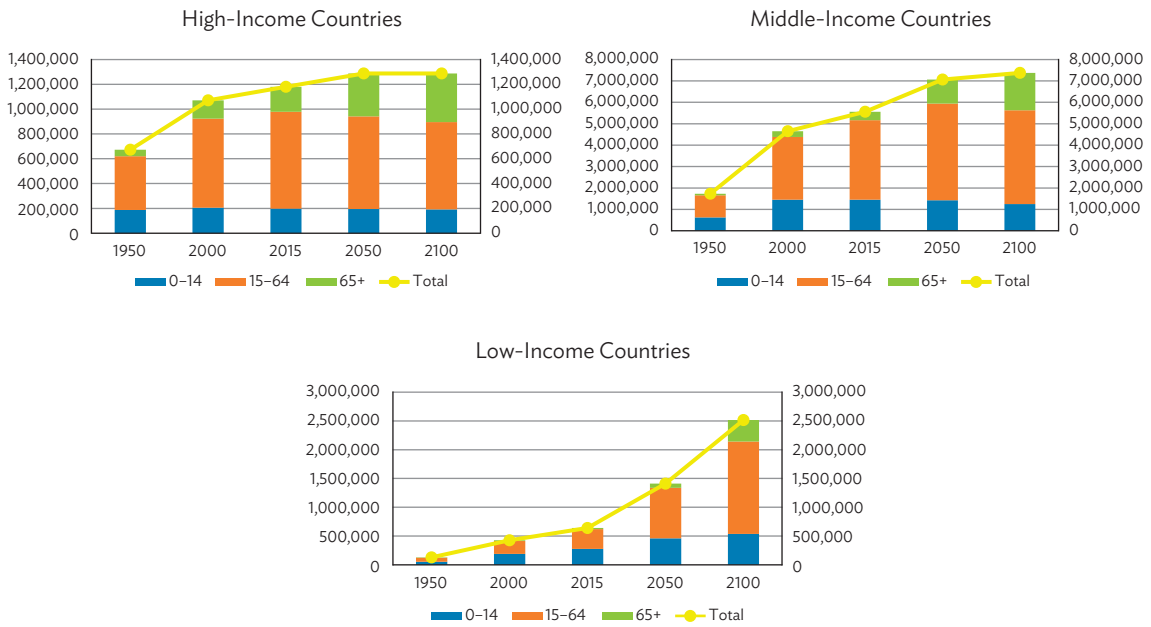
Challenges

The world is in the midst of demographic change, with varying degrees, toward population aging. According to the United Nations (2017), globally the population aged 60 or above is growing faster than all the younger age groups. There are an estimated 962 million people aged 60 or over in the world, accounting for 13% of the global population. The number of older people in the world is projected reach 1.4 billion in 2030 and 2.1 billion in 2050, and could rise to 3.1 billion in 2100.

Figure 1 shows the projection of the world population by broad age group and income group, which indicates a decreasing growth rate of population in high-income and middle-income countries. The population aged 65 or above is forecast to grow constantly in both income groups. On the contrary, the population structure of low-income countries shows an increasing growth rate with a bigger working population between 15–64 years old.

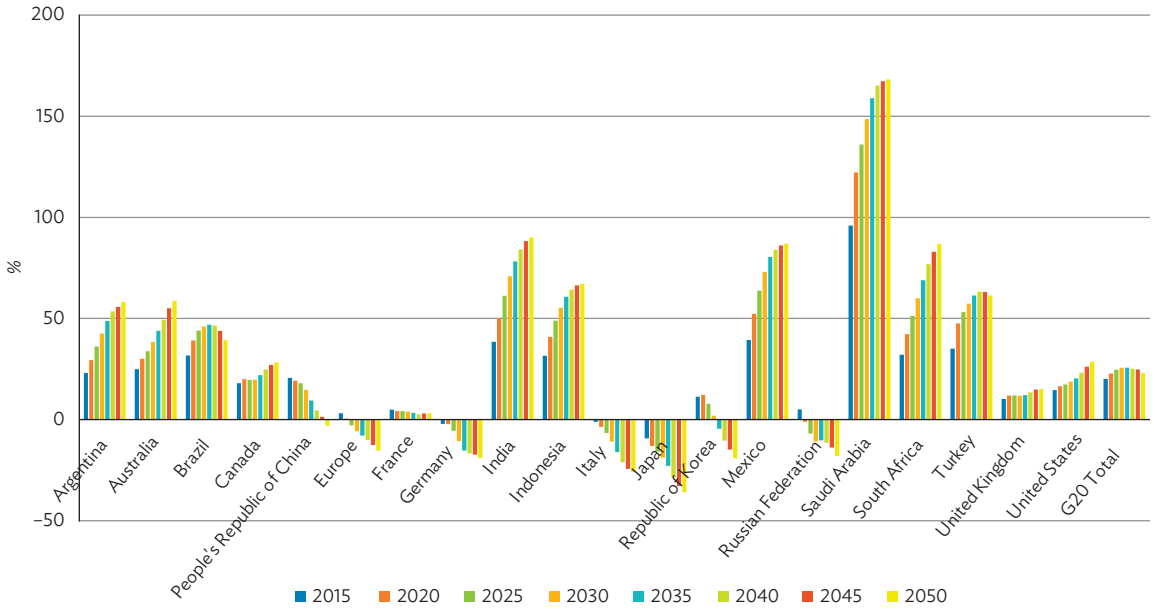
For the Group of 20 (G20) community, diversity is shown among the member countries. According to the United Nations (2017), the working population is projected to rise in some members, e.g., India, Indonesia, Mexico, Saudi Arabia, South Africa, and Turkey, while members like the People's Republic of China (PRC), the European Union, Germany, Italy, Japan, the Republic of Korea, and the Russian Federation are likely to experience a declining trend of the working population (Figure 2). The overall working population of the G20 is forecast to be constant.

Figure 1 World Population by Broad Age Group and Income Group (thousands)



Source: United Nations (2017).

Figure 2 G20 Working Population, Aged 20–64 (% of base year 2000)



Source: United Nations (2017).

On the other hand, most G20 economies are projected to experience a significant degree of population aging (Figure 3). Different degrees of population aging are forecast among the economies.

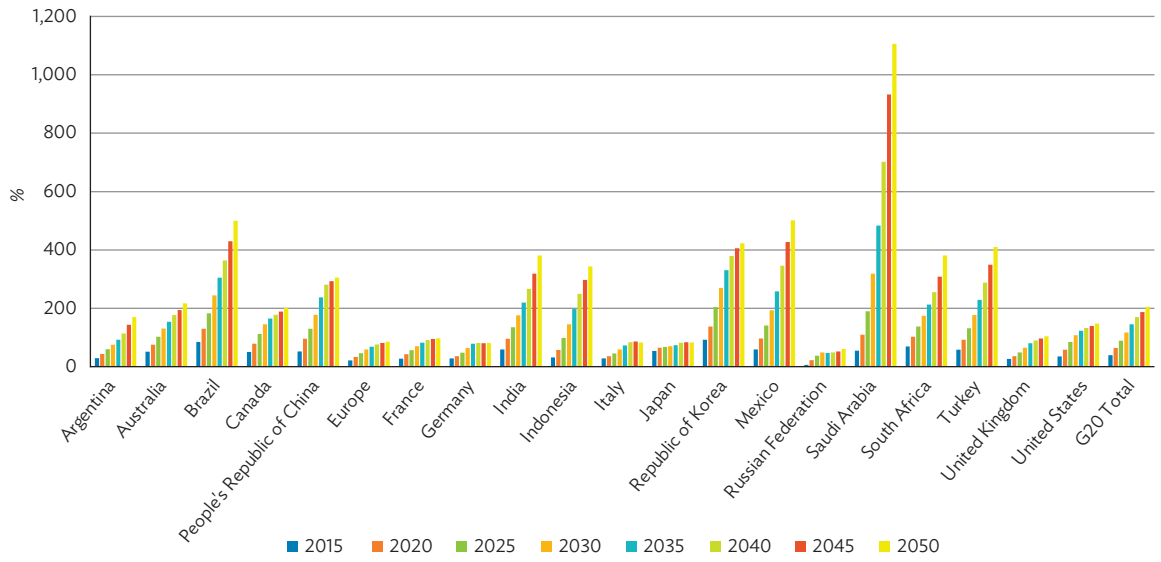
Taking a closer look at the ratio of the aged population to the working population in 2015, Japan and Italy experienced the most significant impact as they possessed the highest ratio at 46.2% and 37.8%, respectively (Figure 4). However, when looking at the speed, emerging economies in the G20 are aging at much faster rates. For example, the projection shows that the PRC, India, Indonesia, Turkey, and Brazil will continually experience significant increases in their populations aged 65 and over until 2050.

The impact of population aging is enormous and multifaceted. For an economy like Japan, the advent has been long pronounced as reflected in the forms of a deteriorating fiscal balance, changes in the patterns of saving and investment, and a shortage in labor supply, leading to a decline in productivity and economic growth. Some empirical evidence shows declined effectiveness of macroeconomic policies due to the aging population in Japan (Yoshino and Miyamoto 2017).

Moreover, for developing economies, this phenomenon of rapid population aging, before the economy has developed sufficiently, usually raises economic and social challenges, particularly in terms of sluggish economic growth and fiscal sustainability, such as a decline in tax revenues, an increase in government public expenditure, and the lack of an adequate welfare system. An indirect impact also comes through productivity and economic growth.

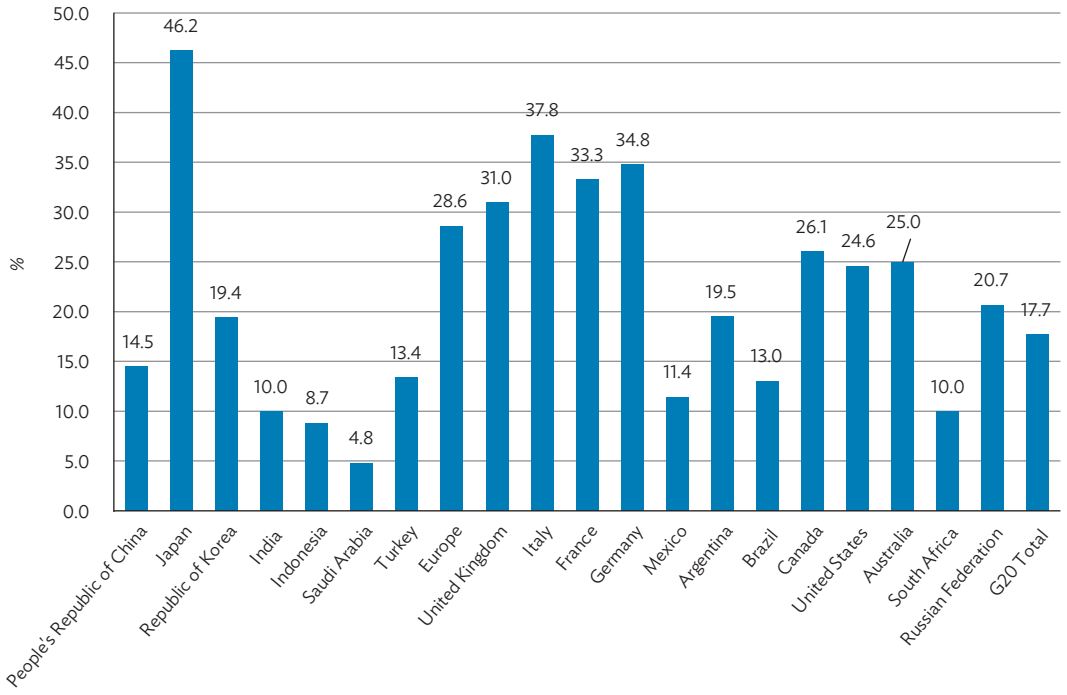
Taking into account the severity of possible impacts to the economy, international communities, including the G20, have placed more attention on the aging phenomenon as well as starting intensive discussions on policy options and responses to its impacts. In the face of an aging population, it is imperative for both developed and developing economies to identify and determine such impacts as well as to develop and design appropriate policy responses to ease the negative impacts on society and the economy.

Figure 3 G20 Population, Aged 65 and Over (% of base year 2000)



Source: United Nations (2017).

Figure 4 Ratio of Aged Population to Working Population, 2015 (%)



Source: United Nations (2017).

Impact Analysis

Macroeconomic Variables

As mentioned above, an aging population influences the pattern of economic behavior in society. As people get older and reach retirement age (approximately 60–65 years old), their behavior switches to spending less due to income constraints and fixed spending only on necessary goods and services.[1] In parallel, a shrinking working population due to population aging creates an impact through changing financial patterns of savings and investments. On the one hand, a smaller base of spenders, i.e., the working population, with the complement of a bigger base of seniors, i.e., retirees, brings about a decrease in aggregate consumption. On the other hand, lower aggregate income results in lower domestic savings, which limits new investment.

At an early phase of the demographic transition, an increase in the proportion of workers enhances aggregate consumption, cumulative investment, total labor input, thus output, which is called the demographic dividend. As the transition progresses, a significant drop in labor supply, due to lower fertility and mortality rates, lowers aggregate output as well as domestic savings; thus, a decrease in investment. This change in

[1] While private consumption tends to decline with aging, combined public and private consumption rises very sharply with age in many high- and middle-income countries. The total consumption with aging depends on old-age support systems, among others.

economic behavior can cause sluggish economic growth and potentially threaten national reserves and economic stability.

It is well documented that an aging population leads to capital deepening and hence higher output per worker (Lee, Mason, and NTA Network 2014; Mason and Lee 2016). However, there are concerns that an aging population might lessen total productivity of an economy, in the context of seniors' capacity to adopt new technologies and innovation. Generally, seniors learn new technologies or approaches more slowly, which can hamper the overall productivity in the face of the fast-changing global economy with rapid technical progress. Without such capacity, there is a risk that productivity and economic growth will reduce.

That said, aging is not necessarily adverse to growth, given that a longer life may require more savings and make investments in education more attractive. In such a scenario, a decline in the labor force due to aging can be offset by higher productivity with increased capital, physical and human, accumulation, and technological innovation. Indeed, some studies claim that there is no evidence of a negative relationship between aging and gross domestic product (GDP) per capita (see, for example, Acemoglu and Restrepo 2017). As such, there is a clear need for further work to more accurately identify the economic impacts population aging could bring.

Fiscal Sustainability

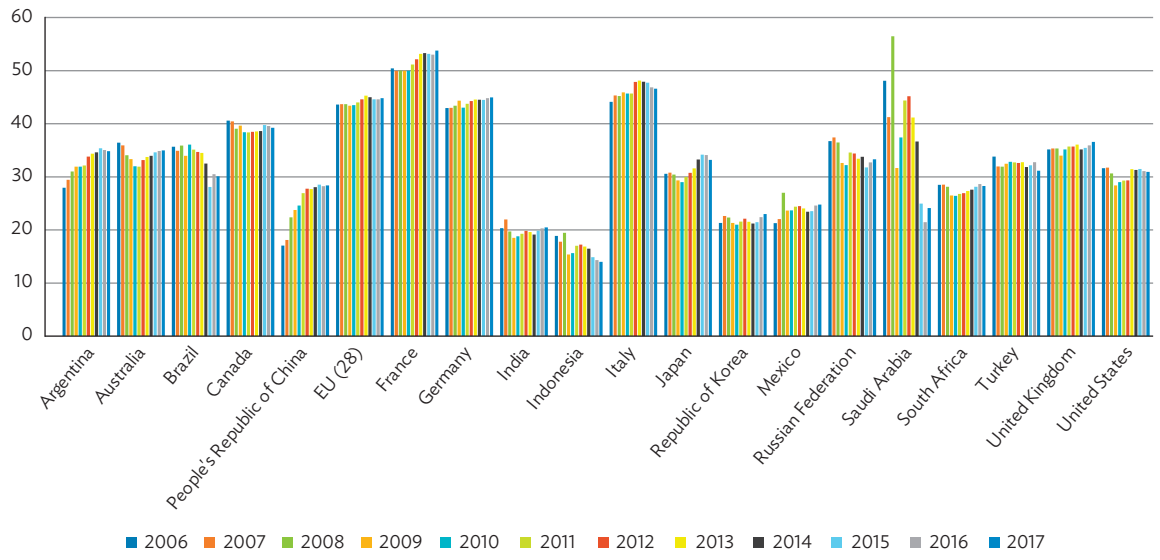
The rapid growth of an aging population can pose a serious structural challenge to fiscal sustainability. Two main channels are referred to: (i) a shrinking working population, who are taxpayers; and (ii) increasing government expenditures for aged-related programs, particularly health care. In many high-income countries, pensions also play a crucial role and are as important as health-care spending. The complementary nature of these two factors will create a serious burden on public finances. In other words, a government's ability to collect tax revenue decreases due to a smaller base of taxpayers while government expenditure, particularly on health care, continuously increases.

The side effect also comes from a reduction in economic growth corresponding to the diminishing productivity. In this circumstance, tax collection would be jeopardized. As a foundation of economic and social development and the fundamental source of fiscal revenue, low economic growth will lead to a reduction in national revenues and savings, which in turn will generate negative impacts on economic sustainability.

For the G20 community, nonetheless, clear empirical figures show a decline in government revenue due to population aging. Japan's and Italy's figures show declining trends since 2015 and 2013, respectively (Figure 5). Together, many G20 countries like Japan, Italy, the PRC, the Republic of Korea, and the United States have experienced an increasing rate of gross national debt as a percentage of GDP (Figure 6). In addition to consequences from the recent financial flux and the global economic turbulence, a substantial increase in government spending can pose a further challenge to the fiscal balance. If we consider government expenditure on public health, most of these countries have increasingly spent a big proportion on health (Figure 7). As fiscal revenues get smaller and government expenditure continues to increase, a massive burden on public finance will be further reflected.

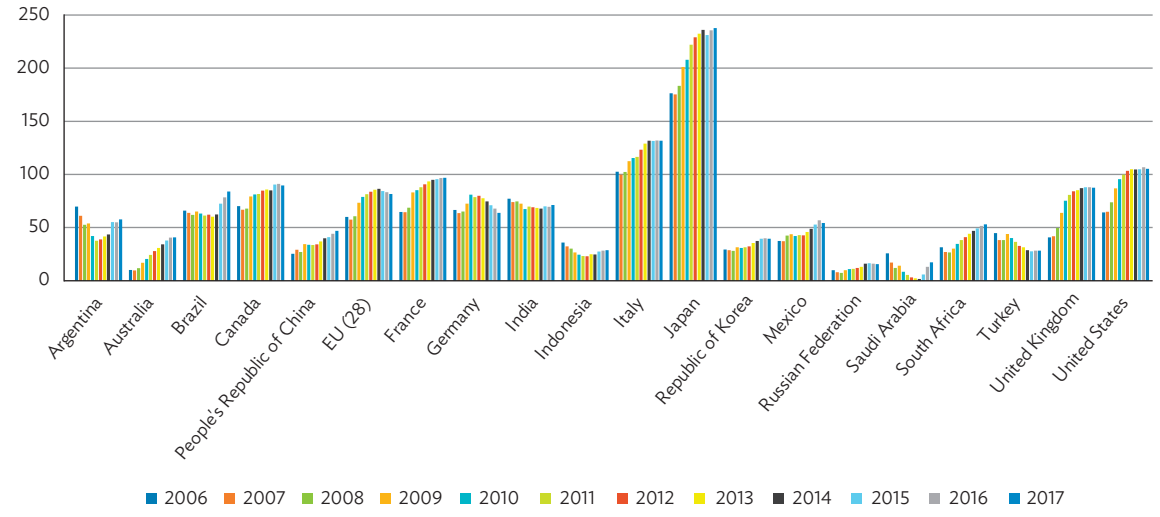
Consequently, sluggish economic growth can threaten economic and financial stability. Lower economic growth implies a reduction of national revenue and savings that are a foundation of economic and social development as well as the fundamental source for government revenue. With low national income and reserves, a country can put itself at risk of insufficient social development and economic unsustainability. In other words, the current high level of both public and private debt in many economies would leave them poorly positioned to handle the coming effects of population aging.

Figure 5 Government Revenue (% of GDP)



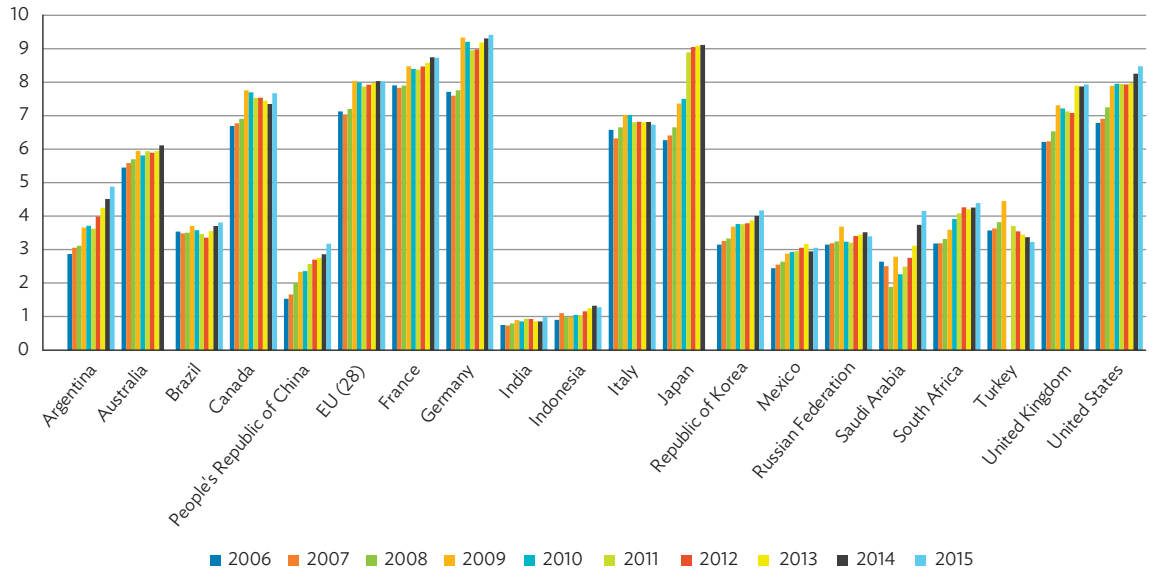
EU = European Union.
Sources: IMF (2018) and EUROStat (2018).

Figure 6 Gross National Debt (% of GDP)



EU = European Union.
Sources: IMF (2018) and EUROStat (2018).

Figure 7 Government Health Expenditure (% of GDP)



EU = European Union.
Sources: World Bank (2018).

Implications to Policy Responses

Besides its impact on economic performance, population aging weakens the effectiveness of traditional macroeconomic—fiscal and monetary—policies as evidenced by Yoshino and Miyamoto (2017). See Appendix for an explanatory description.

For the fiscal policy side, the effects can be distinguished based on groups of the population. Potentially, an expansionary fiscal policy would create a positive impact on the working population as new jobs are created, resulting in a decline in the unemployment rate. In turn, consumption of the working population will rise, which could increase economic growth. On the other hand, the impact on the retired population is negative. The retired population is not affected by this expansionary measure; thus, their consumption remains unchanged while a lower interest rate would reduce their interest income.

As a result, the effectiveness of the fiscal policy is lessened through lower total labor supply and/or working population in the economy. The fiscal balance relies heavily on the ability of the government to collect taxes. Generally, income tax is the biggest proportion of total government revenue. In principle, an aging population pushes down the number of workers, who are taxpayers, thus diminishing tax revenue collected by the government. Additionally, when it comes to a pension scheme, retirees receive pension benefits that are financed by taxes and contributions imposed on active workers and the issuance of government bonds. Given a fixed amount of pension benefits per retiree, the overall burden of each worker is substantially raised with the decreasing size of the working population.

In terms of an expansionary monetary policy, an impact is positive on the working population as investments will increase and wages will rise. This, in turn, will lead to higher consumption of the working population. On

the contrary, an expansionary monetary policy will not affect the retired population because retirees rely on pensions and social welfare.

The study shows that the positive impact of the expansionary policy on consumption is reduced in an aging economy. This is because a consumption decision of the aged is not affected by a change in interest or inflation rates. Unlike the working population, the consumption behavior of retirees is inelastic to price changes due to their limited income and their fixed spending behavior. Although central banks decide to decrease interest rates in order to boost domestic consumption, seniors will only spend the same on necessary and/or routine products. As a result, the ratio of the population directly affected by a monetary policy shock decreases. It also implies the declining effect of the monetary policy due to the diminished marginal productivity of capital faced with an aging population. Taking into account this decline in policy effectiveness, more structured responses and reforms should be in place to address challenges posed by population aging.

Policy Proposals

Any successful policy response to population aging should be geared to encourage economic growth, higher productivity, and higher income for workers. As such, policy proposals to address challenges of macroeconomics and fiscal sustainability arising from population aging are presented in three areas of quantity and quality of labor supply, public finances, and pensions.

Recommendation 1: Comprehensive Structural Reforms for Improving Quantity and Quality of Labor Force

To cope with a diminishing working population, greater participation of senior and female workers should be encouraged to maintain the size of the labor force. A resultant higher proportion of the working population will maintain or enhance the taxpayer base as well as help reduce the amount of tax paid by worker-transferred pension benefits. With these two factors combined, the results can lead to (i) an increase in government ability to collect more tax revenues, and (ii) a potential increase in productivity, which will be followed by rising consumption, savings, and investment, hence leading to economic growth. There are several ways to facilitate older people to stay longer in the work force, including postponing retirement by removing mandatory retirement laws, prohibiting discrimination against seniors, and encouraging the creation of government jobs for seniors. Measures to remove discriminatory practices toward women and keeping a balance between work and life are important, as well as to bring female workers into the labor market. Additionally, promoting the greater role of women's productivity and the use of female workers in the health-care and long-term care systems will improve market efficiency as well as the quality of the labor force while dealing with the aging phenomenon.

In particular, keeping older people in the labor force for longer periods would be an effective tool as a policy response to decreasing the effectiveness of macroeconomic policies (Yoshino and Miyamoto 2017). The logic is simple. In the long run, encouraging older people to continue working will bring higher output and, consequently, a higher level of consumption. As older people continue to be employed, they do not rely heavily on social welfare, which could lower the level of taxes. Thus, the tax burden on the younger generation will decline as their disposable income and their consumption rise. To facilitate such a process would require reform measures in the wage system and heavy investment in human capital.

The first reform is to redesign the wage system from the **seniority-based wage system** to a performance-based one, under which wages are paid at the level of marginal productivity of labor. In a country like Japan, this reform is critically important not only to encourage greater labor force participation among older people

but also to create more labor movement toward high-productive segments of the economy. The second is to invest more in human capital and education. As living standards are determined by productivity in the long run, productivity-enhancing life-long education and/or training programs must be offered to both working and aging populations to overcome an individual's technical limitations and ensure their capacity to adopt and adapt to technological advances.

Recommendation 2: Public Finance Reforms

As population aging rapidly progresses, its fiscal consequences are enormous. Accordingly, it is imperative for governments to take decisive actions to minimize such fiscal imbalances arising from the aging phenomenon. As stated, fiscal sustainability hinges on two channels, tax revenue and fiscal spending, each requiring robust and credible reform measures.

As national debt positions deteriorate in accordance with population aging, government fiscal balances rely heavily on the ability of governments to correct taxes. The seemingly easiest way is to raise taxes—payroll, consumption, and other taxes. However, a large increase in taxes inevitably leads to a growing burden that will result in the reduction of consumption and investment, and to the distortions to economic behaviors. Accordingly, the reform should be more on an **expansion of the tax base**—by restructuring the tax framework to rely more on other types of tax beyond individual income, namely, corporate, excise, and luxury taxes. The other option is to carefully review individual income tax structures in relation to the progressive rates to increase the tax base on high-income groups and adjust the tax base on middle-income groups. The third possible approach is to reform tax reductions and incentives as well as tax exemptions. These measures would equally allow extra space for government fiscal balances.

As for the **reform of government spending**, a careful review of government expenditure, especially for health-care and age-related programs, is required to lessen the tax burden and fiscal deficit. The most important matter is to keep costs under control by removing unnecessary and unjustified expenditures that are not linked to improvements in health care and other welfare services. The vigorous reform measures in the health sector, including more use of market mechanisms, demand controls, and supply-side controls, that need to be tailored to each country's characteristics would be further warranted to stabilize spending and thus fiscal sustainability.

Recommendation 3: Reform of Public and Private Pension Schemes

Along with the health-care system, public pension schemes are where urgent reforms should be considered for fiscal sustainability. First, to clearly understand the status of pension schemes, a long-term actuarial balance management framework should be implemented taking into account, social, economic, and demographic impacts. Second, an appropriate pension level should be determined based on its impacts on the living standards of seniors, government fiscal and social burdens, and economic growth. Last, the designed framework should be verified regularly on an annual basis to ensure timely responsiveness of the pension scheme to current changes and circumstances. It is also recommended to equip the framework with socioeconomic parameters to capture the effectiveness of pension schemes.

Based on such regular reviews from the vigorous framework, it is recommended to take relevant measures to improve the financial status of pension schemes. Included measures are (i) raising the retirement age, (ii) increasing contribution rates, (iii) introducing compulsory government subsidies, and (iv) abolishing unjustified benefits. The other option would be to switch from a pay-as-you-go system to a fully or partially funded system. Pension funds, if well managed, can contribute to national savings, investment, and growth while reducing the fiscal burden.

Modifications to private pension schemes are also recommended to strengthen income security for aged workers. These include (i) encouraging progressive employer contributions to retirement pension programs through offering tax incentives or other types of government subsidies as evaluating an optimal return for fiscal sustainability, (ii) improving asset diversification to enhance financial status, and (iii) upgrading information sharing by building pension databases.

Consequently, a number of initiatives have been introduced and recommended to ensure the fiscal sustainability in the face of an aging population. Given the serious impact of this phenomenon to the economy, the G20 community seriously considers adopting appropriate measures in preparation to cope with the medium- and long-term consequences. The statistics continue to show an increasing trend of an aging population and its negative impacts to the economy, which link to a community's wealth and economic stability.

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Appendix

Aging Population and the Effectiveness of Monetary and Fiscal Policy: Japan Case Study

Naoyuki Yoshino and Hiroaki Miyamoto

Japan's economy has entered an aging society as evidence shows significantly rising life expectancy in the country. Japan's life expectancy has shifted from 24 years old 2000 years ago, to 54–55 years old (as retirement age was 50) in 1950, and 87 years old for women and 81 years old for men (as retirement age was 60–65) in 2018. These figures imply longer years of financial support and/or social security after retirement. Statistically, if we look at Japan's gross domestic product (GDP) per capita by using the total population (working and retired population), the number is not impressive. However, if we look at the GDP per capita of Japan by using only the total working population, the number is comparatively high. Thus, the focus should be on an increase of the retired population and find solutions to relieve its impacts.

This phenomenon of population aging has affected Japan's economy remarkably. The impacts can be seen through (i) expanded budget deficits due to decreases in tax revenue and a huge increase in social security expenses (one-third of total government expenditure goes to the social security scheme), and (ii) a big amount of monetary base or money supply in Japan caused by the government's attempt to maintain a negative interest rate policy. Besides the impact on the consumption side, investment in Japan has become inelastic to a change in the interest rate. Although the interest rate is negative, investors do not want to invest more, because low aggregate demand is expected in the aging economy.

To explain the ineffectiveness of the macroeconomic policy, the authors use a dynamic stochastic general equilibrium model for two different groups of population, i.e., working population and retired population.

- **Worker's problem:**

$$\max \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \left\{ \frac{1}{1-\sigma} \left[\left\{ \omega c_{w,t}^{\frac{\zeta-1}{\zeta}} + (1-\omega) g_t^{\frac{\zeta-1}{\zeta}} \right\}^{\frac{\zeta}{\zeta-1}} \right]^{1-\sigma} + \frac{m_{w,t}^{1-\gamma}}{1-\gamma} - \frac{h_{w,t}^{1+\mu}}{1-\mu} \right\}$$

$$\text{s.t. } c_{w,t} + k_{w,t} + m_{w,t} + b_{w,t} = w_t h_{w,t} + r_{k,t} k_{w,t-1} + (1-\delta) k_{w,t-1} + R_{t-1} \frac{b_{w,t-1}}{\pi_t} + \frac{m_{w,t-1}}{\pi_t} + d_{w,t} - \tau_{w,t}$$

- **Retiree's problem:**

$$C_{r,t} = s$$

The findings indicate that, although the government imposes an expansionary monetary policy, the total output is lower than expected due to population aging. Together, the consumption level does not respond to a positive government shock in the aging economy.

The effect of an expansionary monetary policy on the working population is positive as a lower interest rate would stimulate investment levels, which in turn increases employment. Higher employment numbers will raise wages for the working population; thus, consumption will rise. The impact on the retired population, on the other hand, is limited because retirees' income relies on pensions and social welfare, which are independent to a change in the monetary policy. Consequently, if the aging population continues to rise,

the working population would shrink with an increasing number of retirees. This implies a higher independency on the monetary policy of the total population, in other words, less effectiveness of the monetary policy.

To stimulate an economy by fiscal policy, the government usually creates new jobs in the market. Generally, it would work with the working population and the unemployment rate will decline. With a higher income, consumption of the working population will rise. However, in an aging population, retirees do not look for a job; thus, they are not affected by an expansionary fiscal policy. Consumption rates remain the same.

To examine the impact of fiscal policy further, the authors use the data of the Organisation for Economic Co-operation and Development (OECD) for the following specific models:

Specification 1: $y_{i,t+k} - y_{i,t} = \alpha_i^k + \gamma_t^k + \beta^k shock_{i,t} + \varepsilon_{i,t}^k$

- y = log of output (debt-to-GDP ratio, private-investment-output ratio)
- *shock* = an unanticipated public investment shock
- α = country fixed effects
- γ = time fixed effects

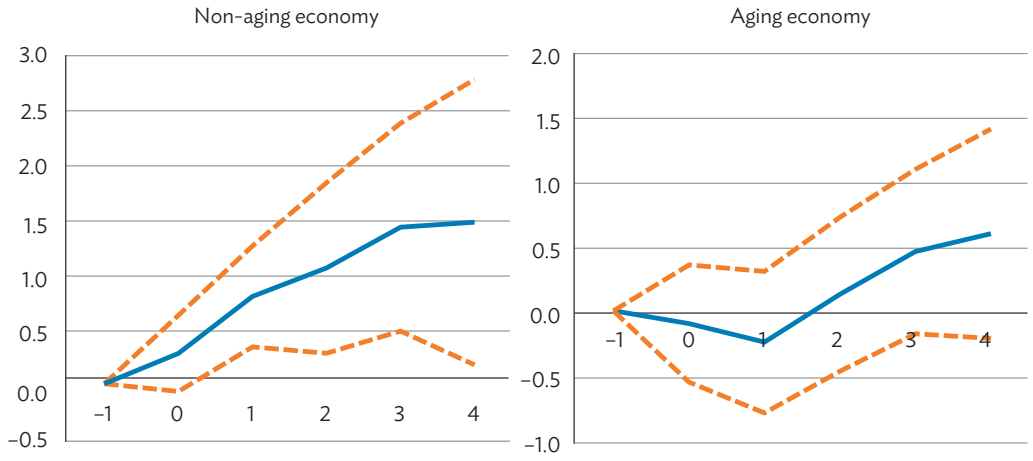
Specification 2: $y_{i,t+k} - y_{i,t} = \alpha_i^k + \gamma_t^k + \beta_1^k G(z_{i,t}) shock_{i,t} + \beta_2^k \left(1 - G(z_{i,t})\right) shock_{i,t} + \varepsilon_{i,t}^k$

with $G(z_{i,t}) = \dfrac{\exp(-\delta z_{it})}{1 + \exp(-\delta z_{it})}, \ \delta > 0$

where δ is an indicator of public investment efficiency

The result shows a higher effectiveness of fiscal policy (public investment) in a non-aging economy compared to an aging economy (Figure 3A.1).

Figure A1 Impact of Fiscal Policy (Public Investment)



Source: Authors' calculations, Yoshino and Miyamoto (2019).

In conclusion, the recommendation drawn is for postponement of the retirement age with the application of productivity-based wage rates. This will improve both productivity, output growth, and consumption while the tax burden or tax rate will decline. To achieve this policy recommendation, structural reform is required for Japan.

Taxation in Aging Societies: Increasing the Effectiveness and Fairness of Pension Systems

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Abstract

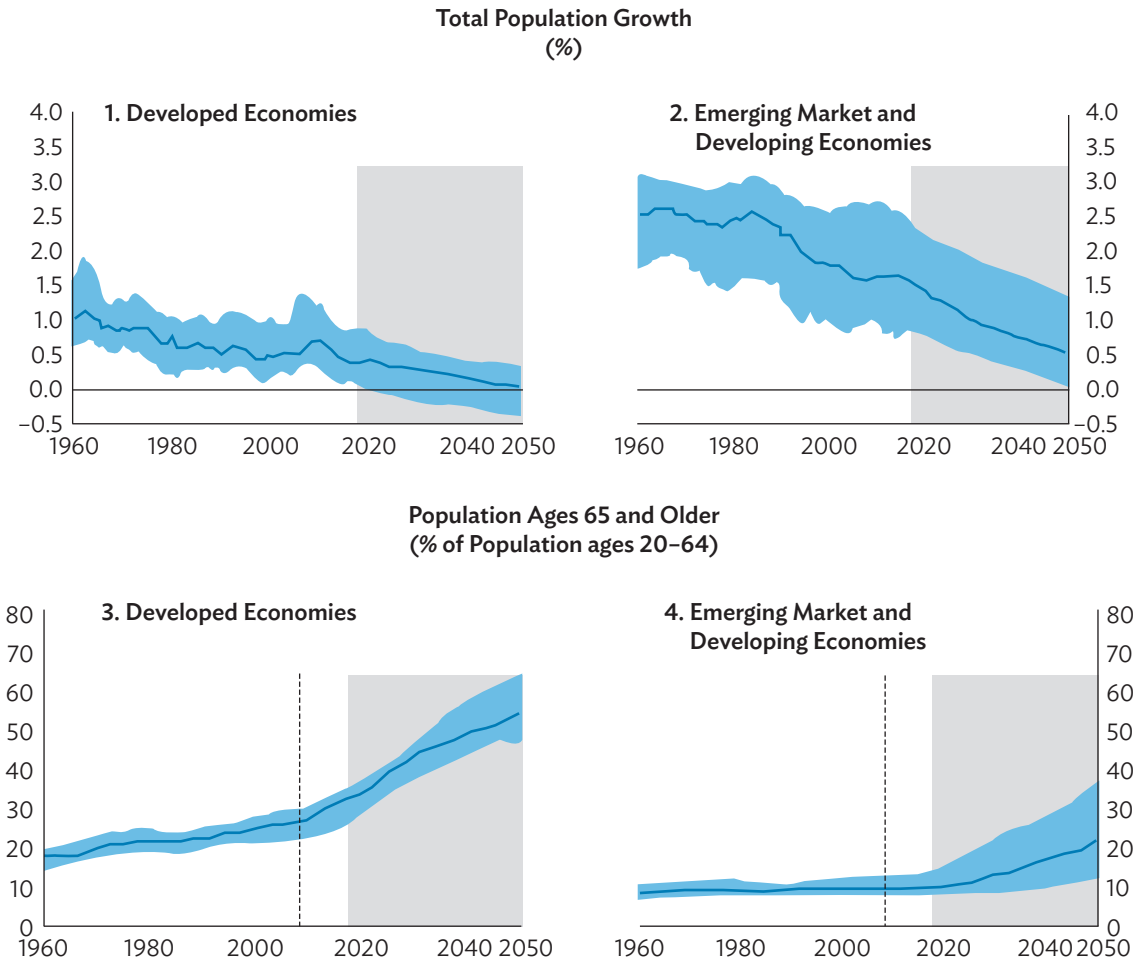
Population aging is accelerating worldwide and has significant socioeconomic implications, including a decline in the size of the labor force, an increase in the age-dependency ratio, and a redistribution of income and wealth. Hence, the redesign of pension systems has become a priority. Taxation is crucial to influence behavior and tackle these issues, e.g., tax incentives for pension savings. Yet, whereas some progress has been made, much remains to be done to increase the effectiveness and fairness of pension systems. Thus, we urge the Group of 20 governments to take a systemic view of pension systems including socioeconomic aspects such as education, migration, labor force participation, and labor market informality. Moreover, governments should take into account the distributional impact of tax policies for pension savings.

Challenge

Population aging is accelerating due to a broad range of factors, including rising life expectancy and a decrease in fertility rates. This phenomenon is not new for developed countries but has also recently been spreading in several developing and emerging economies (Figure 1). The region of East Asia and the Pacific, for instance, is experiencing aging faster—and on a larger scale—than any other region in history (World Bank 2016).

The aging of societies has significant socioeconomic implications, including a decline in the size of the labor force, an increase in the age-dependency ratio, and a redistribution of income and wealth. Therefore, the redesign of pension systems has become a pressing matter and a challenging issue for governments worldwide.

Figure 1 Demographic Transition: Recent Trends and Projections



Note: Solid lines show median, and blue shaded areas show interquartile range. Gray shaded areas indicate projections. Dashed vertical lines in panels 3–4 show year 2008.

Source: IMF (2018), based on United Nations and IMF staff estimates.

Guaranteeing adequate retirement income is vital to ensure that the benefits of economic growth are equitably distributed across society. For instance, the latest Organisation for Economic Co-operation and Development (OECD) survey for Mexico recommends to "raise and broaden the minimum pension to expand the old-age safety net" (OECD 2017). At the same time, in many countries public spending on pensions accounts for a large share of budget deficits. In Argentina, 47% of total federal revenue goes to pensions, and the deficit of the pension system accounts for 4.7% of GDP (Castiñeira 2018).

Against this background, governments across the world have been trying to shift the burden of providing retirement income out of the public sector by boosting private savings for pensions, e.g., shifting from "pay-as-you-go" (PAYG) systems (where pensions to retired workers are financed by the current contributions of active workers, usually via payroll taxes) to funded systems, where contributions are accumulated in workers'

individual accounts along with earnings on these assets, and the total amount of contribution at retirement is converted into a pension annuity.

Yet neither of these two systems has proven to be the *panacea*, with both presenting pros and cons. PAYG systems may entail a redistributive component, if pension benefits are not tightly linked to previous contributions (e.g., in a defined benefit system) and provide insurance against the longevity risk, as individuals receive a real annuity, regardless of how many years of retirement they enjoy. Yet, PAYG systems can be subject to economic and demographic shocks. Low economic growth and population aging reduce the financial capacity of the system and require policy measures, such as cuts in pension benefits, increases in retirement age, increases in payroll taxes, or pre-funding. Funded systems are typically less exposed to economic and demographic shocks. However, they face financial market shocks, as the pension benefits depend also on the realized returns on the accumulated contributions. Moreover, these schemes allocate most of the risk to the individuals. In the case of low wages or discontinuous working careers, typically experienced by women, the accumulated contributions and the earnings on these contributions may not be enough to secure a decent pension.

Taxation is one of the key policy instruments used by governments worldwide to influence behavior and tackle these issues. The myriad of tax incentives to boost pension saving is a case in point. Yet, whereas some countries have managed to improve their pension systems, the overall scenario remains worrisome and much remains to be done.

Dealing with the aging of societies and the reform of pension systems is a complex issue that depends on country-specific factors. Hence, no "one-size-fits-all" solution exists. Yet, population aging is a global phenomenon that affects an increasing number of societies. Moreover, the transversal impact of this issue (e.g., on fiscal sustainability, migration, and cross-border investment flows) as well as the ongoing globalization of the economy call for more and better coordination among governments. As the main platform for international economic cooperation, the role of the Group of 20 (G20) will be vital to develop sustainable solutions to address issues associated with the aging of societies.

Proposal

Proposal 1: Governments should take a systemic view of pension systems

Several countries have already taken concrete steps to deal with the aging of societies and its impact on the sustainability of pension systems. These steps range from the specific (including cutting pension benefits and raising retirement ages)[1] to the comprehensive (such as the 2008 pension reform in Chile and the 2012 Fornero reform implemented in Italy).

Yet, in most cases, there is a lack of an overall systemic view. This generates potentially inconsistent policy choices that can jeopardize the overall effectiveness of the reforms. If governments aim to increase the fairness and sustainability of pension systems, they should engage in comprehensive reforms that go beyond the assessment and modification of specific features of the retirement systems, and include broader aspects that are often not part of the policy debate, e.g., education or financial literacy (Lusardi and Mitchell 2007, Chetty et al. 2014) and migration (IMF 2018). The different tax treatment of alternative saving instruments is another case in point. In Australia, for example, retirees rely both on pensions (superannuation) and home ownership as saving instruments. Yet, these instruments are taxed differently, which triggers distortions. In concrete terms,

[1] On 1 January 2019, the Russian Federation started raising the retirement age by 6 months per year up to 65 years for men and 60 years for women, from the previous 60 and 55 years, respectively (Vlasov and Mamedli 2018).

whereas the superannuation tax system is taxed on a TTE basis—i.e., (low) tax on contributions, (low) tax on earnings, and exemption for pay-outs, and owner-occupied housing benefits from full prepaid expenditure tax treatment or TEE (Ingles and Stewart 2017).

We discuss the interactions between fiscal policy and two other elements that are crucial for the effectiveness of pension systems: labor force participation and labor market informality.

Labor Force Participation

Labor force participation is key for the coverage of pension systems. A 2017 International Monetary Fund (IMF) report shows that, developed economies, the evolution of aggregate labor force participation rates has been highly heterogeneous across countries (IMF 2017). But similar trends do emerge for specific groups such as women and elderly workers. Among developed countries, the participation of elderly workers has increased since the mid-1990s, particularly among those aged 55–64. In the past decade, increases have also been recorded among those aged 65 and over. Likewise, female labor force participation rate has increased by almost 10 percentage points over the last 3 decades. In this regard, Japan stands out. Since the early 2000s, in Japan, the labor force participation rate of women increased 10 percentage points from 66% to 76%, overcoming the United States (US) whose rate went down from 76% to 74% (Shambaugh, Nunn, and Portman 2017).[2]

Female and elderly labor force participation tends to increase with economic development. Hence, in some developing and emerging economies, the scope to increase the participation of women and elderly workers is significant (Box I). For instance, female labor force participation is strikingly low in some emerging economies, including in some G20 countries. In India, the rate is as low as 28%; in Mexico, 43%; in Argentina, 46%; and in South Africa, 49%. Yet, whereas in developed economies the increase in female labor force participation rates is seen as an indicator (and a determinant) of progress and economic growth, in developing countries this is not necessarily the case. Indeed, very often, the participation of women is associated with poverty. That is because women are likely to enter the labor market, even accepting lower wages and worse conditions than men, due to a necessity rather than a choice (Verick 2018). The same applies to elderly workers. In the Republic of Korea (ROK), for instance, older people are pushed to accept jobs of poor quality, with low job security and wages, and limited access to social insurance. Hence, the share of poor aged 50–75 in the ROK is significantly higher than in most of the other OECD economies. As the OECD (2018) suggested, expanding tax benefits like the earned income tax credit (EITC) to also cover elderly workers has been a good move and the government should raise EITC payments for people aged 50 and above as well as improve its coverage, particularly when it comes to older self-employed workers.

Pension reforms have gone a long way into boosting labor force participation among elderly workers. Mandatory increases in the statutory retirement age and in the number of years of contributions required to be eligible for an old-age pension have resulted in increased employment rates for workers aged 55 or more. For instance, in Italy, the Fornero reform in 2012 raised the male retirement age to 66, increased to 41 the years of contributions required to access the early retirement pension and indexed these two requirements to changes in the expected longevity. While these measures were successful in increasing the effective retirement age and the elderly workers' participation rate, a demand for more flexibility at retirement emerged. Individual workers seeking to exit the labor market, for health or family reasons, and firms in need of restructuring their labor

[2] Labor force participation rates usually do not take into account unpaid work such as caregiving. Accounting for unpaid work significantly increases female working hours. On average, women in OECD economies spend almost two times more time in unpaid work than men (264 and 136 minutes per day, respectively). The difference is even larger in emerging and developing countries, e.g., in the People's Republic of China (the PRC), India, and South Africa, men (women) spend 91 (234), 59 (352), and 103 (250) minutes on unpaid work, respectively. https://stats.oecd.org/index.aspx?queryid=54757.

Box 1 Is the Old-Age Dependency Ratio Too Old?

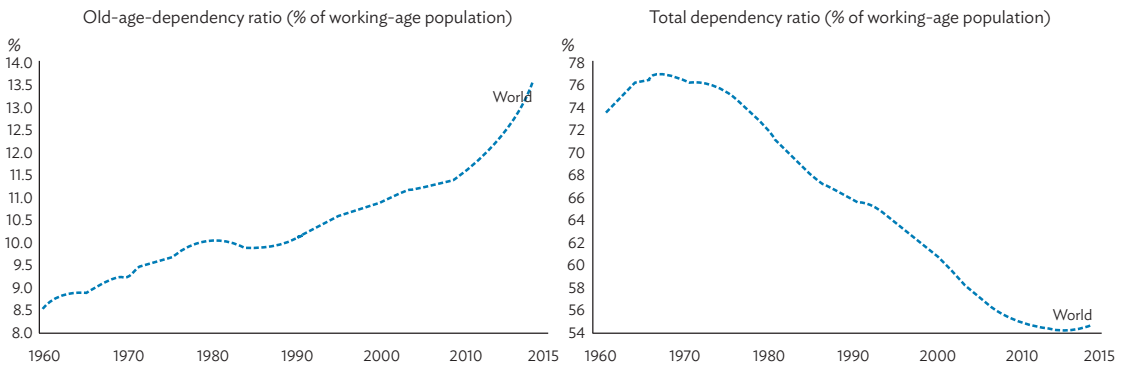
The old-age dependency ratio (the share of people older than 64 to the working-age population, i.e., those aged 15–64) has been the most widely used indicator to capture the aging of societies since its creation more than a century ago. Yet, some argue that the more recent total or economic dependency ratio is more relevant, since it takes into account changes in life expectancy, labor participation, and health spending (Sanderson and Scherbov 2016).

For instance, the evolution of labor force participation among elderly workers should be considered. As discussed above, many workers no longer stop working at 64 years old. This, in turn has a direct impact on the share of adults that are active in the labor market even after having reached the legal retirement age and, hence, on dependency ratios.

Likewise, broadening the scope of dependency ratios is likely to have a major impact on female labor participation since this takes account of the dramatic fall in childcare responsibilities of households since the 1960s.

As shown in the figure, considering the old-age or the total age dependency ratios provides a radically different picture.

Old-Age and Total Dependency Ratios



Source: World Bank staff estimates based on age distributions of United Nations Population Division's World Population Prospects: 2017 Revision.

As discussed by Sanderson and Scherbov (2016), whereas the old-age dependency ratio in the US is forecast to increase by 61% from 2013 to 2030, forecasts based on the total economic dependency ratio show a significantly lower increase of only 3% in the same period.

At the same time, using the total dependency ratio provides an even stronger case to tackle the gender workforce participation issue. Female work time is increasingly being redirected away from childcare in the household toward market work throughout the life cycle. Once, the reduction in childcare responsibilities is internalized, the potential for boosting female labor force participation becomes even more significant. Provided that women have access to the same working conditions as men, this will have significant long-term positive effects on private income, tax revenues, and retirement savings for men and women.

force demanded measures that allowed early exit. This demand for flexibility is legitimate, but costly—both for individuals and for public finances. Individuals who retire early should face actuarially fair pension benefit reductions. But even in this case, the short-term public budget deteriorates, as new (early retirement) pensions needed to be financed. Due to the actuarially fair reductions, these pensions are less generous, but the overall effects on the public budget evens out only over a 23-year period. An additional rationale often provided is that early exit of elderly workers from the labor market makes room for the entrance of young workers—thereby providing a solution to the youth unemployment problem. However, this argument—known as the "lump of labor fallacy"—has largely been disputed empirically. The recent pension reform in Italy, known as "Quota 100", allows for early retirement of individuals aged 62 or above with at least 38 years of contributions, but requires no actuarially fair reduction to the pension benefits. Hence, pension spending is set to increase by €22 billion in 3 years. To allow for early retirement with a fair penalty but with no direct impact on public finances, in 2017, Italy introduced an innovative market mechanism, called APe Volontaria, which allowed individuals to borrow against their future pensions. Individuals willing to retire up to 3 years earlier than their normal retirement age could borrow a monthly amount to be repaid in the next 20 years after retirement with monthly repayments withdrawn on their pension. Tax credits were provided to reduce the cost of the loan. This measure was off to a good start in April 2017 but was largely affected by the discussion about the introduction of Quota 100, which proved more convenient to the retiring workers, albeit much more costly for the public budget. Early retirement is also an issue in Spain. The tax authority (AIREF) recently published a report calling for a restriction of early retirement by reducing the number of exceptions that allow 40% of the 300,000 active workers that retire every year to stop working before the legal age of retirement (67) and, hence, push down the effective retirement age to the actual 62.4 years.[3]

As mentioned, labor force participation can also be influenced by (fiscal) policies that are not directly linked to the pension system. The US EITC is a case in point. The EITC—one of the largest tax expenditures in the US that, in recent years, has distributed around $70 billion a year to almost 30 million lower-income families and lifted more than 6 million people out of poverty—is a refundable tax credit requiring recipients to work. Previous literature assessing this provision has shown that the EITC increases employment (Meyer and Rosenbaum 2001) and earnings (Dahl, DeLeire, and Schwabish 2009) of lower-income mothers. In a recent paper, Bastian and Michelmore (2018) assess the longer-run effects of the EITC on educational attainment and employment outcomes of children whose mothers received the EITC. The authors find a positive impact on high school graduation, college graduation as well as employment and earnings when these children grow up. In addition, their results show that these positive effects are largest for children from the poorest households. Hence, the EITC is not only effective in increasing short-term (women) and long-term (children) labor force participation, but also has a significant inequality-reducing effect.

Labor Market Informality

Informality levels are strikingly high in several regions, particularly in several developing and emerging economies. On average, informal employment is as high as 85.8% of total employment in Africa, 68.2% in Asia and the Pacific, and 68.6% in the Arab States. Whereas informality rates can be considerably lower in developed countries (e.g., Estonia 6.9%, Norway 7.4%, and Slovenia 5%), this is not always the case. In some G20 emerging economies, for instance, informality rates are very high, e.g., India (88.2%), Indonesia (85.6%), the People's Republic of China (PRC) (54.4%), and Mexico (53.4%). However, it is also relatively high in a developed country such as the ROK, where informal employment accounts for 31.5% of the total (ILO 2018).

In general, informality significantly hinders the effectiveness of fiscal policy. For instance, a large informal sector narrows tax bases and, hence, generates pressure to increase tax rates. Moreover, since the burden

[3] http://www.airef.es/es/gasto-en-pensiones/ (in Spanish).

of taxation is shifted to those paying taxes, informality also violates the horizontal equity principle; i.e., two individuals that are identical but for the sector in which they perform their economic activities (formal and informal) receive a different fiscal treatment. Aside from horizontal equity, informality also can exacerbate income inequality since, on average, formal workers have higher wages and work for larger and more productive firms than informal ones.

As discussed by Levy (2017), informality is particularly relevant in the context of aging societies. Since it significantly reduces retirement plan contributions, informality considerably lowers replacement rates (pension entitlements/pre-retirement earnings). In turn, a low coverage rate (as well as informality) disproportionally affects the poor and, hence, intensifies inequality.

Chile provides an illustration. The country's replacement rate stood at 38% in 2012, lagging behind the 63% OECD average (OECD 2015). Moreover, whereas income distribution is highly skewed—the richest (poorest) 20% captures 54% (5%) of total income—the distribution of pension income is even more unequal: while the bottom quintile gets 2%, the top one receives 63% of the pie.[4]

In addition, in Chile replacement rates are around 35% (i.e., pensions represent roughly 35% of the worker's pre-retirement wage), which is significantly lower than the 70% OECD average (Levy 2017). Although it may not be the only factor, informality is certainly among the main determinants of such a low replacement rate since it reduces the share of the time that workers spend in the formal sector and hence contribute to their pension, relative to the time that they work (either in the formal or informal sector).

As mentioned, governments worldwide aim to tackle this issue and increase replacement rates through the implementation of different retirement savings' policies. Some of these measures, such as raising social security contributions and raising retirement ages, lift savings automatically. Other measures, such as tax incentives for savings, rely upon individuals taking action. Using Danish data, Chetty et al. (2014) show that policies which depend on active choices are less effective: 85% of savers do not react to tax subsidies and, of the remaining 15% who do respond, most action takes the form of shifting assets between accounts, leaving overall savings largely unchanged.

Chile's decision to eliminate the opt-out option for self-employed workers in 2018, and thus to make social security contributions mandatory, seems aligned with this insight since the policy would not require active choices to increase coverage rates. However, Denmark and Chile are different. In Chile, informal workers account for 36% of the total, and 69% of them are self-employed (CIEDES 2016). Hence, unexpected "rebound-effects" could arise if formal self-employed individuals who previously opted out of social security choose to jump to informality instead of start contributing to the pension system, e.g., if contributions were perceived as a tax associated with formality rather than a future benefit.

We urge G20 governments to take concrete actions to tackle the aging of societies and increase the effectiveness and fairness of pension systems. Measures should not be ad hoc and specific, but rather part of comprehensive reform packages going even beyond retirement systems to include other socioeconomic aspects such as education, migration, labor force participation, and informality. Without such a systemic view of pension systems, governments will keep struggling to tackle problems associated with the aging of societies.

[4] For more details, see the World Bank's LAC Equity Lab. http://www.worldbank.org/en/topic/poverty/lac-equity-lab1/income-inequality/composition-by-quintile.

Proposal 2: Governments should take into account the distributional impact of tax policies for pension savings

Inequality—both intragenerational and intergenerational—is one of the main issues triggered by the aging of societies. In PAYG systems, pensions are funded through the contributions of those currently working, who essentially cross-subsidize retired workers. The necessary condition for PAYG systems to work regards the proportion of retired workers relative to those actively working. If the contributions of active workers are not sufficient to cover the pensions of those retired, PAYG systems collapse. Ad hoc solutions could affect retired individuals (e.g., pension benefits are cut), active workers (e.g., retirement ages are raised), or society as a whole (pension systems' deficits are funded through taxes). Distributional effects are inevitable since, no matter the strategy implemented, the burden of the adjustment is shifted among different groups of individuals.

More comprehensive solutions also have significant distributional effects that should not be neglected. The shift from PAYG to contributory systems is a case in point. On the one hand, contributory systems can eliminate regressive cross-subsidies. On the other hand, many countries that switched to contributory systems face replacement rates significantly lower than expected. In many cases, individuals do not even accumulate the minimum required years of contributions to qualify for a pension—again, informality is often one of the main reasons.

Against this backdrop, governments usually try to increase replacement rates by boosting private savings for pensions, e.g., through the implementation of tax incentives.[5] Yet, these provisions are costly and often inefficient in reaching their stated goals.

Tax incentives for pensions are significant. The Australian Treasury estimates the revenue foregone from superannuation tax concessions to amount A$36 billion, which accounts for more than 9% of total tax revenue (Australian Treasury 2018). Likewise, United Kingdom (UK) pension tax reliefs cost £24 billion in relation to income tax (though this is in part a deferral of tax revenue) and £17 billion in national insurance receipts (HMRC 2018). The US Treasury Department estimates that the tax expenditure (roughly revenue foregone) for the favorable tax treatment given to pension contributions and earnings in pension plans approaches $200 billion per year (US Department of the Treasury 2018). Recent efforts by the PRC to develop a three-pillar pension system provides further illustration. While the PRC's public pillar shows widespread coverage, benefits have been insufficient (Liu and Sun 2016). Against this background, the first tax incentive to promote individual savings was announced in June 2018 and three pilot zones were established to test the program.

Besides their fiscal cost, the impact of these provisions in raising pension savings is often marginal and they disproportionally benefit the rich. First, individuals in higher personal income tax brackets are more likely to have the means to save for retirement. In contrast, poorer households struggle to smooth their consumption. To put it another way, saving for retirement is a distant option for many households. Second, pension tax expenditures frequently are "upside down" subsidies since they are granted as deductions or exclusions from taxable income, which exacerbates their negative impact on inequality. As highlighted by Duflo et al. (2006), this design feature entails that the value of these provisions is negligible for families with low marginal income tax rates, and significantly more valuable as income and, thus, marginal tax rates go up. In Switzerland, for instance, a resident of Bern (married, no children, no taxable wealth), with a taxable income of SwF75,000 who pays SwF6,000 into her voluntary Pillar 3a account, is eligible for a tax incentive that reduces her taxes

[5] In some cases, considering the pension system as a whole (i.e., both taxes and benefits), the negative impact on inequality is mitigated or even eliminated. In the US, for example, "The Social Security benefit formula is designed to provide beneficiaries who had lower lifetime earnings with monthly benefits that are higher, as a percentage of their lifetime average earnings, than those received by higher-earning beneficiaries. That progressivity in the benefit formula is only partly offset by the fact that higher-earning individuals tend to live longer and thus collect benefits longer" (CBO 2006). Hence, overall the social security is progressive. Yet, the benefits paid to retired workers (the largest component of the benefits) is less progressive than the system overall.

by SwF1,400. If her taxable income doubles to SwF150,000, everything else equal, the tax benefit goes up to SwF2,300. This is also the case in the PRC, where the recently implemented third-pillar tax incentive is expected to benefit high-income individuals (Insurance Association of China 2018).

If governments decided to incentivize pensions by the implementation of tax benefits, they should consider better targeting the beneficiaries to mitigate their impact on inequality. For instance, tax credits are often less regressive than deductions since the latter reduce taxable income and, hence, their impact depends on the taxpayer's marginal tax rate, which is an increasing function of income. As a result, tax expenditures granted as deductions often end up being "upside down" subsidies that provide larger benefits to high-income families than to low- and middle-income households. Tax credits instead reduce taxes directly and do not depend on tax rates. Indeed, when the tax reliefs are granted as refundable tax credits, the regressive impact is even lower since those with no enough income to benefit from the tax incentives would still be reached by the provision.

In addition, the tax treatment of pensions could also trigger intergenerational inequality. The UK provides a case in point. Median disposable income (measured after accounting for housing costs) are now higher among UK pensioners than among working-age families, reflecting relatively higher rates of home ownership among recently retiring cohorts. Yet pensioners are exempt from paying national insurance on any of their income (either earned income or pension income), making them tax-advantaged relative to working-age families recording the same pretax income (Corlett et al. 2018).

In recent times, the issue of inequality has been gaining *momentum* worldwide. The debate around the design of fiscal policy has been moving away from the traditional trade-off between efficiency and equity. The 2016 OECD "Tax Design for Inclusive Economic Growth" as well as the 2017 IMF Fiscal Monitor on "Tackling Inequality" are cases in point. Tax policies implemented in the context of aging societies have significant distributive effects, which G20 governments should consider to increase the effectiveness and fairness of pension systems.

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Work Capacity and Socially Sustainable Public Pension Systems in Aging Societies

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Abstract

This brief assesses the work capacity in the Republic of Korea and the United States and derives its policy implications. We find that there exists a substantial amount of additional work capacity and that the level of education can lead to an inequality of work capacity. When designing socially sustainable public pension systems, it is necessary to consider the inequality of work capacity as well as an overall improvement of health status. It is desirable to provide the elderly with sufficient time and benefit options to adjust. Fiscal spending to reduce poverty, strengthened safety regulations, and policies to boost the demand for aged workers are also recommended.

Challenge

While public pension programs offer essential income security for the elderly, they also create a fiscal challenge for governments to maintain the programs' sustainability. In most developed countries, these pension programs already account for a significant share of government budgets. In 2015, the total public pension spending of the Organisation for Economic Co-operation and Development (OECD) countries recorded 7.5% of their gross domestic product (GDP), and Greece and Italy spent more than 16% of their GDP on financing their pension programs.[1]

In the midst of retirement of baby boomers, the financial burden of pension programs has been continually growing: For the first time in history, the social security spending of the United States (US) outpaced its projected revenue in 2018. The European Commission forecasts a steady rise in pension expenditures for Greece and Italy by 2040 (European Commission 2018). For the OECD as a whole, public pension expenditures rose by about 2.5% of GDP since 1990 and spending is expected to keep increasing in 21 out of 35 OECD countries by 2050 (OECD 2017).

[1] OECD Data. Pension Spending (indicator). doi: 10.1787/a041f4ef-en (accessed 21 January 2019).

These fiscal challenges have initiated active discussions with policy evaluations to gain long-term sustainability of public pension programs (see Wallenius 2013 and Kitao 2014, for instance).[2] In particular, along with the improvement of the health status of older adults, more pension systems have adopted reforms that can incentivize older individuals to work beyond the previous *normal* retirement age. These policy changes include, but are not limited to, the rise in full retirement age, the extended mandatory contribution periods, and the removal of the early retirement option.

While these policy options would effectively allow governments to regain fiscal sustainability of the public pension systems, the welfare consequences of these pension reforms crucially depend on labor supply responses of the older population. If older individuals attach to the labor force and delay their benefit claims along with the pension reforms, then the welfare impacts of the policy change during the transition periods could be minimal. On the other hand, if older individuals *do not have enough work capacity*, then these individuals would experience income lapses between retirement and benefit claims. As a consequence, the new pension systems could not provide the very social safety nets to their target beneficiaries.

Indeed, recent studies on health conditions find that vast heterogeneity exists in work capacity (and needs for early retirement) depending on socioeconomic status, and the degree of health inequality has been growing over the past 2 decades (Meara, Richards, and Cutler 2008). In this brief, we assess the work capacity of the US and the Republic of Korea, which demonstrate a similar degree of health improvement in recent years but have adopted different public pension programs. By comparing the relation between health, work capacity, and actual employment of the old, this analysis allows us to draw lessons for future pension reforms.

Proposal

Empirical Strategy

The goal of our empirical analysis is to measure the work capacity based on the health status of older men aged between 60 and 74. Unlike younger workers, older individuals' labor market participation decisions could be affected by retirement incentives which are independent from their own work capacity. Similar to Coile, Milligan, and Wise (2016), this brief addresses this issue and quantifies the older male's health capacity to work by taking younger males aged 51 to 54 as a base group. Under the assumption that the influence of public pension programs on younger workers' labor supply decision is limited, we first estimate the relationship between health status and labor market outcomes. Then, by applying these estimates to the actual health status of older males, we obtain the projected employment absent from the influence of pension programs. The measure of "additional" work capacity is defined as the difference of the projected employment rates from the actual employment rates observed in the data.

Data

Since we are interested in the behaviors of older working-age individuals in the labor market, we utilize the panel data sets designed for studying the characteristics of health and economic outcomes near retirement in both countries. For the US labor market analyses, we use the Health and Retirement Study (HRS), a biennial panel survey representing the US population over the age of 50. Similarly, we use the Korean Longitudinal Study of Aging (KLoSA) to estimate the relationship between health and employment of older people in the ROK. Both data sets provide a wealth of information on health measures and labor market outcomes along

[2] Policy options for pension reforms can be grouped into four different categories: (i) increase in tax contributions, (ii) changes in progressivity, (iii) retirement ages, and (iv) the deduction of benefits.

with the status of pension and other government programs, which cover the key dimensions of our research questions. Our empirical analyses focus on male individuals aged between 60 and 74.

Estimation Results

Finding 1: Overall Additional Work Capacity

We first compare the trends of work capacity over the life cycle between the US and the ROK. Table 1 shows the results of our work capacity calculations. In both countries, the estimated probability of working declines with age as health status deteriorates. However, the share of men actually working declines more quickly with age than our estimates predict. As a result, we find that in both countries, a substantial amount of additional work capacity exists, which is rising sharply with age.

Table1 Estimated Work Capacity by Age: United States vs. Republic of Korea

	United States				Republic of Korea			
Age group	51–54 (base)	60–64	65–69	70–74	51–54 (base)	60–64	65–69	70–74
Actual empt. (%)	79.1	58.7	38.9	26.9	88.2	66.1	49.3	35.6
Predicted empt. (%)		76.8	73.2	68.5		82.0	76.0	70.0
Work capacity (pt)		18.1	34.2	41.6		15.9	26.7	34.4

empt = employment, pt = percentage points.

Notes: The employment statistics of the US and Republic of Korea (ROK) are computed based on the Health and Retirement Study (HRS) and the Korean Longitudinal Study of Aging (KloSA), respectively. The work capacity of older workers in the ROK is estimated by the authors based on the KLoSA from 2008 to 2016. The US estimates are cited from Coile, Milligan, and Wise (2016).

Finding 2: Heterogeneity in Work Capacity

To better understand our estimation results, we re-estimate the work capacity by education group and examine possible heterogeneity in capability of working longer. Although aggregate statistics suggest that the overall health status has improved in the last decade, the extent of improvement varies across individuals' socioeconomic status. As a consequence, increasing health inequality may lead to differences in work capacity in older ages by education group, as less educated workers have higher probabilities of having physically demanding occupations and experiencing disability episodes.

Our estimation results are summarized in Table 2. There are noticeable heterogeneities in two dimensions. First, unlike the divergence of actual employment rates of college graduates between the two countries, their predicted employment rates based on health status are fairly similar; the difference in the estimated share of employed population in each age group is in within the range of 1 to 5 percentage points, while the actual employment rates differ by 9 to 20 percentage points.

Another distinction in work capacity predictions and actual employment comes from lower educated workers' capacity to work. Measured by the predicted employment rates, US high school graduates have comparable work capacity with the ROK's individuals with lower than high school education. Their estimated probabilities to work range between 67% to 78%, and the difference in the working probabilities within the same age group is less than 3 percentage points. However, the actual realization of employment rates are 11 to 17 percentage points.

Table 2 Work Capacity by Education: United States vs Republic of Korea

		United States (US)				Republic of Korea (ROK)			
Education	Statistics	51–54 (base)	60–64	65–69	70–74	51–54 (base)	60–64	65–69	70–74
Lower than high school	Actual empt (%)	65.8	46.6	30.6	19.9	81.2	66	52	40
	Predicted empt (%)		64.3	62.7	58.3		78	72	67
	Work capacity (pt)		17.7	32.1	38.4		12	20	27
High school	Actual empt (%)	79.2	54.8	35.0	24.3	90.3	70	53	35
	Predicted empt (%)		77.4	73.5	69.9		85	80	74
	Work capacity (pt)		22.6	38.5	45.6		15	27	39
College or more	Actual empt (%)	80.9	70.7	52.1	38.1	90.6	61	37	18
	Predicted empt (%)		87.7	84.0	80.2		86	82	75
	Work capacity (pt)		17.0	31.9	42.1		27	45	57

empt = employment, pt = percentage points.

Notes: The work capacity of older workers in the ROK is estimated by the authors using the Korean Longitudinal Study of Aging (KloSA) from years 2006 to 2016. The work capacity estimates of the US are cited from Coile, Milligan, and Wise (2016).

Descriptive evidence suggests that the differences in incentive structures of government programs of the two countries could be the results behind these findings. While the immature pension system of the ROK leaves many non-college graduates behind, the US provides a wide range of social safety nets targeting older, particularly less-educated, populations.[3] On the other hand, a lack of additional financial incentives to work among college graduates fails to tap in the possible work capacity of highly educated people from the ROK compared to those in the US.

In the midst of retirement of baby boomers and increasing inequality, it is more important than ever to establish a social welfare system that could reduce elderly poverty while attaining older individuals with work capacity to the labor markets. Based on our findings, we make the following policy suggestions in the context of the ROK. To make policy recommendations concrete, we consider the context for the ROK, but policy recommendations can apply to other similar countries.

Policy Recommendations

Policy 1: Increase the pensionable age slowly enough

First, an increase of the retirement age for pension benefits should be sufficiently gradual that beneficiaries have enough time to plan their retirement accordingly. In the ROK, normal pension payments begin at age 62 now and the pensionable age will gradually increase to 65 years old until 2033. That extension of pensionable age from 60 to 65 was introduced in the 2008 national pension reform and a further reform proposal to age 68 is under discussion. When we consider the additional age increase, the degree of health improvement and the employment opportunities for vulnerable groups rather than the entire group need to be checked. If the long-term health improvement of vulnerable groups and the increase in their employment

[3] In 2016, the ROK's college graduates received annual pension benefits of more than W30 million (or $26,800) on average, while older males with a high school diploma received W15 million ($13,400), and middle school graduates received W9 million ($8,000).

possibilities are uncertain, the prolongation of the pensionable age needs to be carefully decided. In that case, it is desirable to design the incentive structure to be described later.

Policy 2: Provide flexible benefit options

Second, it is desirable to provide flexible benefit options considering growing inequality of work capacity. Extension of a uniform pensionable age and excessive pay cuts can pose an excessive risk to individuals. They should have the right to choose the period of work and the type of work that suits their situation. In the ROK, the pension benefit is reduced by 6% per year up to 30% with early pension receipt and increased by 7.2% per year up to 36% with late pension receipt, which are close to the actuarially neutral level. However, the incentive to work during the pension receipt needs to improve. Pension benefits are reduced with earnings exceeding the average of those insured up to 50% of pension benefit, which essentially works as a tax wedge for labor supply of pensioners preventing the pensioner with a partial work capacity from working further. It is possible to induce the elderly to work part-time by eliminating the penalty on pensioners' earnings.

Policy 3: Complement pension reforms with other welfare programs

With unequal work capacity, public pension reforms may lead more elderly into a risk of poverty, by pushing them to work, despite the lack of work capacity. By enhancing social insurance programs targeting those elderly workers with a limited work capacity, the government can potentially reduce the welfare costs of pension reforms while improving the pension system.

In general, two approaches help individuals with a limited work capacity, or disability (OECD 2010). First, the government can provide direct income support in the form of disability insurance for those who have little work capacity. If proper screening mechanisms can prevent moral hazard problems, disability insurance would be more efficient than maintaining a conventional "normal" retirement age with minimal loss of social welfare. Disability insurance can also accommodate approval criteria for older workers, taking into account their additional difficulties of outdated job skills and education.

While disability insurance is more conventional, more countries have introduced alternative labor market policies to remove barriers to work for those with a limited work capacity since the beginning of 2000. These integration polices can be in the form of support in job search and training (labor supply), subsidized employment for hiring older workers (labor demand), and changing overall cultures and work environment (legislation of anti-discrimination laws). Recently, researchers find that the expansion of integration policies, particularly focusing on the labor demand side, is associated with better labor market outcomes of the disabled in 19 OECD countries (OECD 2010).[4]

Policy 4: Boost the demand for aged workers

The government needs to remove disincentives to hire older workers so that they are encouraged to continue to work beyond the "normal retirement age." For instance, higher insurance premiums for health and disability have been cited as one possible cause for employers to avoid hiring older workers. In 2005, the Netherlands reduced employers' obligations on these social insurance contributions when they hire a person older than 50. Policies can be in the form of providing financial incentives to employees for continuing or renewing the employment of older workers. Moderate deductions in pension amounts or financial gains from extra contributions beyond retirement age can be possible candidates.

[4] The analysis is based on countries including Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Ireland, Luxembourg, the Netherlands, Norway, Poland, Portugal, the ROK, Spain, Switzerland, UK, and the US.

In addition to providing employment support, it is necessary to make policy efforts to eliminate the structural factors that hinder the demand of older workers such as mandatory retirement and seniority-based salary systems. In the short term, temporary rehiring, bridge jobs, and self-employment can be addressed but retirement and salary systems must be fundamentally redesigned to encourage productive people to remain in the labor market. This can lead to an increase in the employment of older workers, an increase in output, and an increase in contributions and tax revenues, thereby improving overall sustainability.

Policy 5: Make the work environment safer

Finally, safety regulations should be strengthened so that more people age healthily. The loss of work capacity is more common than many would imagine. According to the US Social Security Administration, one in five 20-year-old workers entering the workforce exit the labor market before reaching the "normal" retirement age due to health problems. These labor market exit rates are more profound among non-college graduates and physically demanding occupation holders. The industrial accident death rate in the ROK is 8 per 100,000 people, the third highest among the OECD countries, next to Turkey and Mexico.[5]

The loss of work capacity due to industrial accidents can lead workers and their families into financial hardship, and social support costs and personal suffering can be severe. Furthermore, with the extension of life expectancy, the economic and social losses caused by unsafe working environments are expected to continue to increase. To reduce industrial accidents, governments need to strengthen industrial safety regulations and to provide incentives for companies to enhance the working environment. Governments can also encourage firms to develop safer production technologies.

[5] Due to the different standards of industrial accidents, in international comparisons, the safety of a workplace is compared based on the rate of industrial accident deaths.

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Aging, Fiscal Sustainability, and Adequacy of Social Security Systems

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Abstract

Population aging poses unique challenges for social security systems. Developed countries, with well-established structures, will face increasing age-related spending. They will require further reforms that balance spending cuts against core promises across generations. Most emerging economies, on the other hand, lack comprehensive social security yet are aging rapidly. They must establish comprehensive retirement income support structures, universal health services, and publicly supported long-term care in a rapidly changing macro-demographic environment.

This policy brief, while bringing a broad perspective to these challenges, focuses its policy analysis on retirement income, the first frontier in reforming social security systems in an aging world. In line with the United Nations Sustainable Development Goals, our key policy recommendation is that future social security reforms be redirected toward a greater emphasis on noncontributory pension programs that can provide a much-needed safety net for older people. These will be the most important structures to deliver the Sustainable Development Goals, especially for emerging economies.

Challenge

1. Background: Rapid population aging

The last 30 years have seen new social and economic forces emerge which challenge standard models of social security. Population aging, labor market trends, and uneven growth can compromise the insurance, saving, and redistributive functions of social security and result in fiscal stress.

Developed countries, with established social security systems, are facing increasing age-related spending, which will require further reforms that balance spending cuts against core promises across generations and providing for the most vulnerable. Emerging economies, on the other hand, are faced with the task of establishing comprehensive retirement income support structures, universal health services, and publicly supported aged care in a rapidly changing macro-demographic environment (Chomik and Piggott 2015). For these countries, a range of economic and social trends complicate the issue of appropriate policy structure. Labor market disruption arising from technological change, trade openness, and high levels of informal

workforce participation make contributory pension arrangements more difficult to administer. Fewer children, changing social expectations, and large-scale regional migration are compromising intergenerational family support structures. The old, who have exhausted their human capital, are exposed to a range of risks that are difficult to insure effectively in the private market. In the absence of public sector intervention, they will become the most vulnerable.

Social security policies need to be designed carefully. For example, policies that delay retirement may translate to less time devoted to the care of family members. Policies that establish universal pensions may appear to distort behavior less than means-tested programs but are costlier, require higher taxes, and may have more negative impacts. While contributory pension schemes are important, these may inhibit labor force formalization. Indeed, there is a strong case for expanding noncontributory social security in many countries.

Coordination of policy development within and between the Group of 20 (G20) countries could generate substantial benefits. For example, some countries need to make greater use of immigrant labor in aged care and offset declining labor forces (Chomik, Piggott, and McDonald et al. 2017). Education policy needs to be redesigned to deal with longer careers where mature age workers need to retrain more often (Chomik and Piggott 2018).

2. Challenge: Addressing the SDGs in an aging world

Nationally appropriate social security programs are at the center of the Sustainable Development Goals (SDGs). The SDGs envision: (i) social protection with substantial coverage of the poor and vulnerable that insure against economic shocks and address inequality (SDG1 and SDG10); (ii) universally provided health programs that insure against health shocks and offer access to quality essential health-care services and medicines, and an adequately resourced health workforce (SDG3); and (iii) social programs that recognize the gender dimension of unpaid care via appropriate public services and infrastructure (SDG5) (UN 2015).

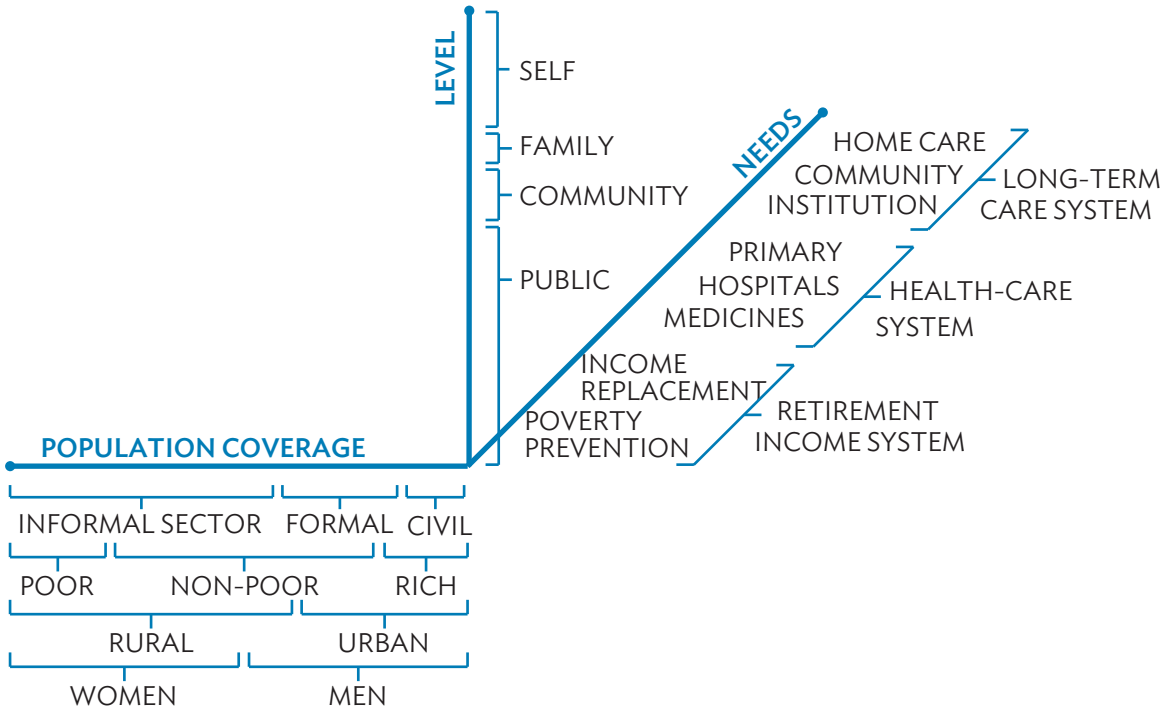
If the goals envisaged under this agenda are to be met globally, then G20 nations—comprising 60% of the world's population and 70% of the population aged 65 and over—will need to initiate and develop policies that deliver on these aspirations, using policy structures which are macroeconomically prudent and fiscally sustainable in the face of demographic change. This is a challenge that developed countries have been wrestling with for some time, with mixed success, and one that emerging economies are beginning to contemplate. How to sustainably address the social security needs of aging populations is therefore of central importance to the G20. It is also an opportunity to rebalance growth across the G20—allowing individuals to pool idiosyncratic risks associated with income and health shocks and reducing the need for excessive precautionary savings.

3. The social security needs of older people as a starting point

The needs of older people are the starting point in designing appropriate social programs. Chief among them are providing retirement income, health services, and long-term care. Other needs commonly addressed via public programs may also be relevant—e.g., housing and social or recreational needs. Each need is addressed to a greater or lesser degree by government, community, family, and the individuals themselves, and differences exist for subgroups within each country's population (Figure 1).

There is a range of settings that define where each country sits along the different dimensions. For example, developed countries will have a small informal sector, whereas in emerging economies, more than half the labor force works in the informal sector, which requires different mechanisms to ensure coverage of social security. It is a framework for thinking about the extent to which public social security systems can serve older people, allowing a wide diversity of national circumstances to be accommodated. But the public sector, which can pool risks across generations and provide substantial economies of scale, is critical. Some responsibility

Figure 1 Dimensions of Social Protection for Older People



Source: Chomik (2016).

will remain in private hands: voluntary self-provision of savings, co-payment for health care, and especially informal care provision for old age.

4. How should governments respond?

Public policy design should be flexible enough to cope with changing demographic structures and encourage macroeconomic growth, which funds revenue for public outlays. It should also reflect and build on the local context. But there is a broad menu of policies that G20 countries should all sign up to (Box 1).

Box 1 Broad Recommendations on a Menu of Policies

To deliver on SDGs in an aging world requires G20 countries to expand public social security coverage, especially to vulnerable older people. The recommended menu of policies includes:

1. A strong first-pillar pension, which prevents poverty among those with exhausted earnings capacity, where poverty is measured by some relative benchmark, for example, 50% of equivalized household disposable income.
2. Universal health care which is accessible and affordable to older people with limited means, including in rural areas.
3. Long-term care policies which offer the option of formal support in home and institutional settings, especially where younger relatives are absent or wish to engage in the formal labor force.

Each of these recommendations requires a detailed treatment. Because of space considerations, the focus here is on retirement income, the first frontier of social policy reform in responding to an aging demographic. We also cover macroeconomic considerations that ultimately help fund such social programs. We leave to other G20 processes the detail of health and long-term care policy design. Recommendations relating to retirement income policy are summarized in Box 2, followed by a discussion of the evidence.

Box 2 Specific Recommendations on Retirement Income Policies

To deliver on SDG commitments in an aging world requires reforms of retirement incomes systems, such as:

1. the establishment and expansion of noncontributory pensions, especially in emerging economies;
2. to deliver adequacy and sustainability within such programs, age-eligibility for pension access should be monitored and increased with rising mature age life expectancy;
3. benefits should be targeted to the less well off;
4. those who can afford to save for retirement should be required to do so, through a contributory earnings-related retirement structure, either unfunded or pre-funded. Depending on the stage and rate of change of demographic structure, sustainability may require transition to pre-funding; and
5. wherever possible, both first- and second-pillar pensions need to be designed in a way that encourages labor force participation across the age distribution to maintain macroeconomic integrity.

Proposal

5. What makes a retirement income system?

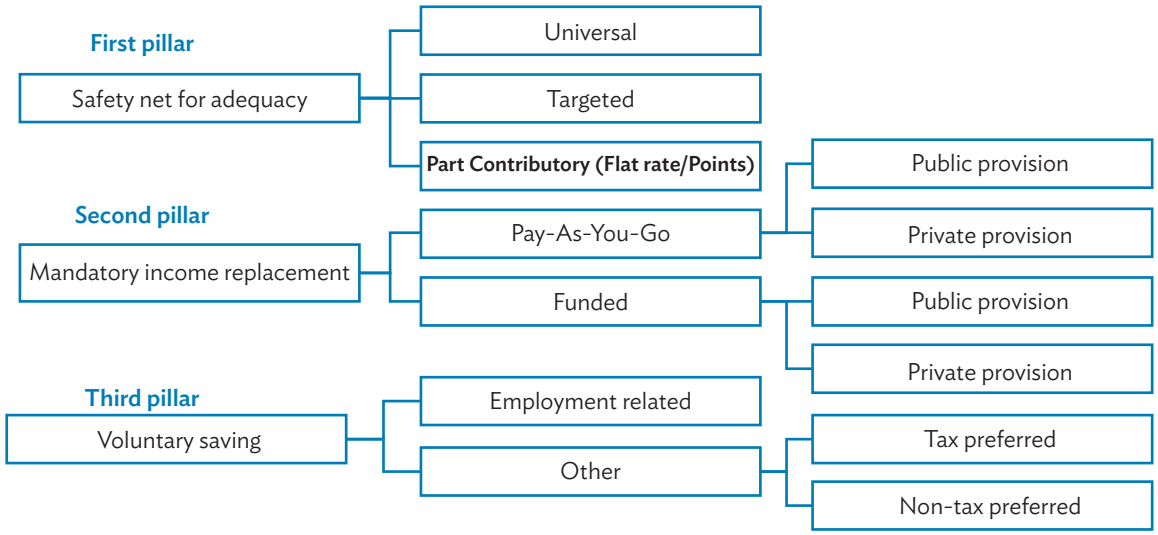
Each country has a different retirement income system. They are best systematized in terms of three pillars (Bateman, Kingston, and Piggott 2001; OECD 2017) (Figure 2).

First-pillar benefits are unrelated to an individual's past earnings and are sometimes referred to as noncontributory or social pensions. The payment, financed out of general revenue, may be *universal* (i.e., available to all eligible citizens above a certain age) or *targeted* (i.e., dependent on the retiree's other resources). It may also depend on a minimum number of years of work, citizenship, or contributions—in this way first-pillar schemes may be partly contributory and not strictly a safety net. These schemes serve as a safety net for those without other savings and safeguard against poverty. That is, their primary aim is to ensure a minimum *adequacy* of retirement incomes.

By contrast, the aim of the second pillar is to *replace income* enjoyed before retirement. The benefits are typically related to a person's salary, based on some *defined benefit* formula or on some *defined contribution* into a funded or notional (NDC) account. Second-pillar benefits can be *unfunded*, wherein the individual has a legal claim on the future revenues of employers, insurers, or governments, or *funded* with an underlying accumulation converted into a lump-sum or income stream. Such schemes can be administered through public social security programs or through private pension funds at arm's length from government.

The reason for mandating saving in a second pillar is twofold. First, without it, some people with the capacity to save will nevertheless choose to rely (or "free ride") on the first pillar (Hayek 1960). This is of most concern

Figure 2 Retirement Income Designs



Source: Authors' compilation.

in countries with means-tested payments, where lower personal savings mean greater public support. Second, mandatory saving acts as a commitment device. Many people may want to and can afford to save a portion of their income for retirement but do not get around to it, displaying myopic behavior (Mitchell and Piggott 2016).

There is also often a third pillar, involving incentives for further voluntary saving for people who want retirement incomes beyond the mandated level.

Most G20 countries have some form of targeted noncontributory pension. In most developed countries, this is in the form of social assistance (Table 1). Benefits generally sit between 15% and 25% of average wages and are heavily means tested, so that only a small fraction of older cohorts receive payouts from these programs. For these countries, the major form of publicly funded retirement income support is a traditional pay-as-you-go social security, a second-pillar structure.

Any of these second-pillar arrangements are now under increasing strain from a Demographically induced decline in the ratio of contributors to beneficiaries. Consequently, some countries have converted to pre-funded or NDC second-pillar systems that limit publicly funded second-pillar payouts.

For emerging economies, the pattern is different. Sometimes, the first pillar does not exist or requires a minimum level of contribution. This is the case, for example, in the People's Republic of China (PRC), India, and Indonesia, three G20 countries which between them account for about 40% of the world's population. Where such structures do exist, payments are often very low, mostly below 10% of average wages. Second-pillar structures tend to be uneven, with generous benefits for civil servants. For informal sector workers, which in the emerging G20 countries overall constitute a large minority of workers, and in many cases a majority, no second-pillar plan exists at all. This is one reason countries such as the PRC have developed heavily subsidized

Table 1 Summary of Pension Systems in Selected Countries

	First Pillar (Adequacy)				Second Pillar (Income Replacement)			Third Pillar (Voluntary)	
	Noncontributory		Part-contributory		Compulsory income replacement			Supplemental	
	Universal	Targeted	Flat-rate	Points/ formula	Pay-as-you-go	Funded: Public	Funded: Private	Employment related	Other tax preferred
Argentina		■	■		■				
Australia		■					■	■	■
Brazil		■	■		■				
Canada	■	■			■			■	■
China, People's Republic of				■	■			■	
France		■			■				■
Germany		■			■				■
India		■			■	■		■	■
Indonesia						■		■	■
Italy		■				■		■	
Japan			■		■			■	
Korea, Republic of				■	■		■	■	
Mexico		■					■	■	
Russian Federation		■		■				■	
Saudi Arabia					■				
South Africa		■						■	■
Turkey		■		■			■	■	
United Kingdom		■	■				■		■
United States		■			■				■

Note: Shaded area indicates existence of scheme in a given country. The People's Republic of China's individual account—based urban employee pensions are unfunded in practice (i.e., notional defined contribution or NDC). Canada and the Russian Federation are gradually switching their unfunded second pillars to become funded.

Source: OECD (2017).

part-contributory schemes which lie somewhere between a noncontributory safety net and a contributory income replacement pillar. These raise coverage but provide little substantive benefit. To deliver on SDGs more is needed.

6. How to strengthen first-pillar pensions across the G20?

To deliver on SDG commitments, the focus of G20 efforts should be on the first pillar. These schemes must be expanded in range and relevance, ensuring that as the world ages, older and most vulnerable citizens are looked after. This will be important in developed countries as automation makes work more precarious and the changes in industry structure generate more contingent workers disconnected from contributory structures and in emerging economies with large informal sectors.

Several key choices need to be made when designing an effective first pillar. For example: What should the access age be? How should benefits be set and maintained over time? Should the benefits be means-tested and how?

Local values, objectives, and constraints will influence the answer. But existing research and policy experience from across the G20 can guide the policy makers' hands. Strategies to deliver adequate but sustainable first-pillar schemes include ensuring that the benefit is high enough and pegged to wages, that eligibility age is also high and increased with mature-age life expectancy (at least of the poorest), and that benefits are targeted (generous pensions are likely to operate more efficiently with sharp means-testing) (see Chomik et al. 2015). Box 3 summarizes some of these design issues.

Box 3 First-Pillar Design Considerations

Who is eligible? Most countries require residence or citizenship for eligibility to first-pillar pensions to avoid pension-based migration. Sometimes current residence suffices but it is common to require a number of years of residence after a certain age or within a number of years of claiming the pension.

At what age to pay benefits? This parameter should be consistent with the policy's purpose—to provide support to those with largely depleted productive capacity. It is often a controversial parameter to reform but is one of the most important levers to keep pension schemes sustainable. As such, both fairness and sustainability are relevant to the choice of access age (Chomik and Whitehouse 2010).

What is the benefit level? Choosing the level of benefit is clearly value-laden, related to social views of poverty. For example, the beneficiaries' needs and basic acceptable standard of living could be judged against some absolute value (e.g., a fixed basket of goods) or against prevailing, economy-wide community standards. Most developed countries adopt a community standard (OECD 2013). Once a benefit level is set, it needs to be adjusted over time. To strengthen first-pillar pensions, G20 countries should ensure that benefits are indexed to community standards or wages, rather than prices (Whitehouse et al. 2009).

If means testing is done, which resources are tested? One way to provide a sustainable first-pillar scheme is to target it. Whether and how assets or income is included is a trade-off between comprehensiveness; feasibility (e.g., in developing countries it may be easier to only assess existing pensions) political sensitivity; and behavioral considerations (e.g., excluding some earnings may incentivize work).

If means testing is done, how is the benefit determined? Determining how much benefit is paid requires three sets of parameters: (i) the maximum benefit (received by the poorest); (ii) the disregard (an initial threshold of other pension, income, earnings, or assets that is not tested); and (iii) the taper (or withdrawal) rate. These instruments can also act as useful policy levers, for example, encouraging people beyond the access age to work longer by increasing the disregard threshold or withdrawing benefits gradually. A shallower taper is more generous but more expensive and affect more people up the income or asset distribution; both these effects increase the distortionary tax needed to finance the policy.

Population aging reinforces the sustainability of a means-tested design in two ways (Kudrna, Tran, and Woodland 2018). First, as people live longer, they save more for their retirement, and this will reduce the payouts of a means-tested pension. Second, mortality differentials between poor and rich make a means-tested pension equity enhancing; that is, they provide more pensions to lower income, shorter-lived residents compared to universal schemes (Waldron 2007; Cristia 2009).

In emerging economies, the delivery of age-related benefits to people in the informal sector can be challenging (Chomik and Piggott 2018). Various studies examine the efficacy of digital technology in delivering social programs in developing countries. Some of these involve identification and information, others involve payment mechanisms (e.g., Muralidharan, Niehaus, and Sukhtankar 2016). These tools can help deliver first-pillar payments in emerging economies.

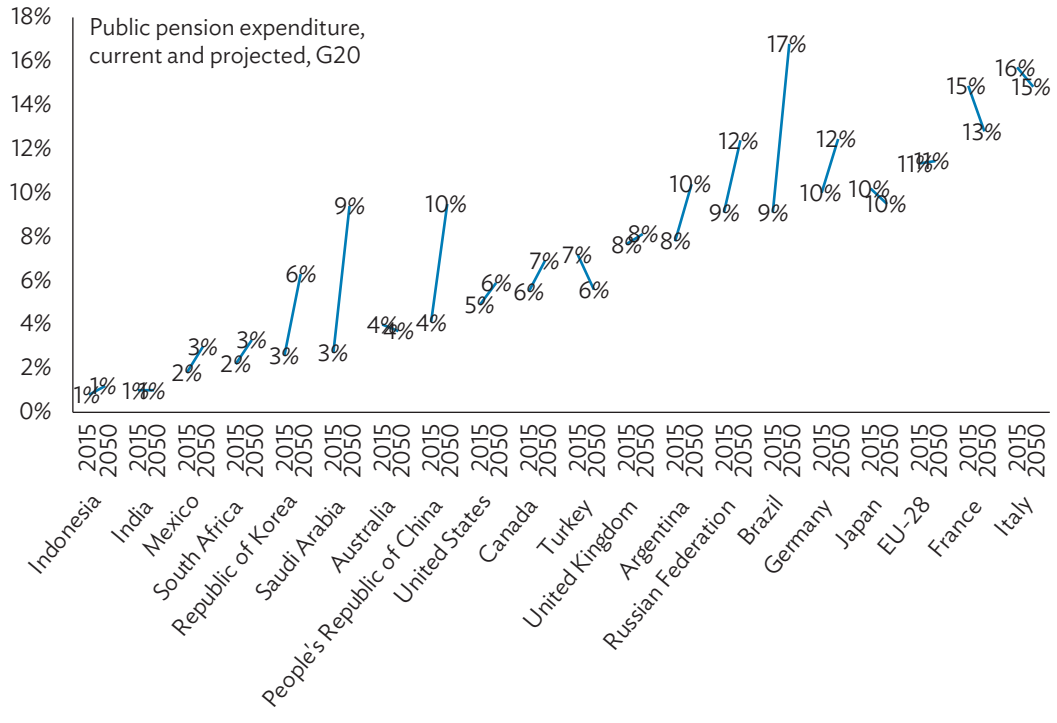
A first pillar, especially if means tested, should be accompanied by a mandatory or heavily incentivized income-related scheme to minimize free riding. We now turn to such second-pillar structures.

7. How to ensure effective and sustainable second pillars across the G20

A key issue with second-pillar schemes is their sustainability. In many countries, traditional pay-as-you-go second-pillar structures are likely to become unsustainable as demographic changes take hold. Some countries have pared back benefits but, across the G20, pension spending growth remains of concern. For example, public pension expenditure in Germany has reached 10% of GDP—driven largely by its second pillar—and despite various reforms this is expected to increase to 12% by 2050 (Figure 3). This is high by global standards and calls into question the long-term sustainability of the system. Some emerging countries are repeating the mistakes of developed countries. For example, the generosity of the second pillar of Brazil and the PRC will likely see their pension spending soar in future.

Both the structure and design parameters of the second pillar can affect its sustainability. For example, a pre-funded, defined contribution pillar (e.g., in Australia or Mexico) adjusts automatically to the economic and

Figure 3 Expenditure on Retirement Incomes: Sustainability is a Concern



EU = European Union.
Source: OECD (2017).

demographic environment—if people don't contribute enough, retire too early, or live longer, they will receive fewer benefits in retirement. The incentive to work and save is clear.

Unfunded, defined contribution schemes can incorporate adjustment mechanisms by, for example, reducing benefits with fewer contributors (e.g., in Germany or Japan) or requiring higher contributions (e.g., in Japan). But the link is obscured by benefit formulas and often overridden for political reasons. The most radical reforms have moved to a pre-funded defined contribution structure (e.g., Canada and the Russian Federation). Others implemented an NDC structure where individual accounting keeps track of a notional accumulation, and annuity-type benefits are paid at retirement.

Where sustainability remains a challenge, parametric reforms could include increasing contributions, reducing benefits, or increasing eligibility age. The G20 countries have implemented each of these to a lesser or greater extent. Currently, Italy has the highest contribution rate at 33% of earnings, well above the G20 average of 19%. Australia, Indonesia, the ROK, and Mexico have set the contribution rate at less than half the average. Eligibility age has also gone up but is not keeping up with life expectancy.

Among emerging countries, sustainability is of less concern. Here, a lack of coverage of the second pillar is the greatest challenge. The driver is high levels of informality. Informal employment is defined as unregistered, unregulated, or unprotected remunerative work or non-remunerative work in an income-producing enterprise. It is especially prevalent in emerging economies, ranging from one-third of total employment in South Africa to over 80% in India and Indonesia. Developed country rates are non-trivial, at between 10% in France to almost 20% in the United States. A trend to a more flexible workforce may see such numbers increase and the reach of second-pillar pensions decline. Efforts to incentivize informal workers into second-pillar pensions may need to involve heavy subsidies (e.g., as in the PRC) but if these are not unwound, the schemes could in turn become less sustainable.

While strategies to contain public costs via better targeting of the first pillar and better self-provision in the second pillar are important, policies that affect economic activity—which in turn provides a tax base for public revenue—are critical during the demographic transition.

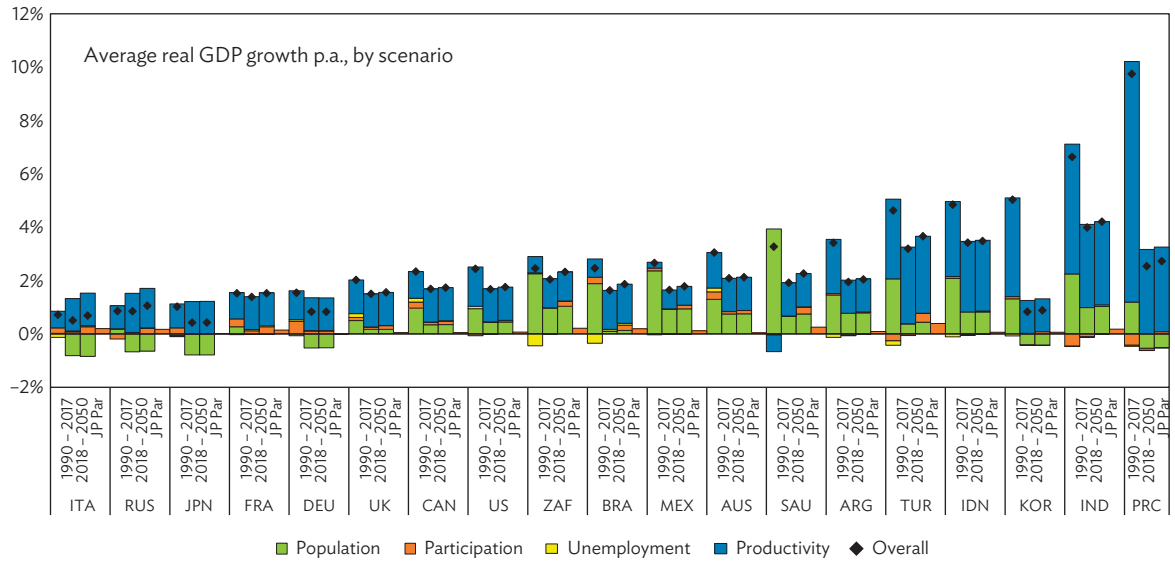
8. How can social security contribute to macroeconomic integrity across the G20?

Economic activity can be decomposed into the population available for work, the proportion in employment, and the average level of productivity of workers. This population–participation–productivity framework lends itself to long-term modeling of the aggregate supply side of GDP.

Here we track the composition of GDP growth across the G20 between 1990 and 2050.[1] The calculations are based on the product of historic and projected data relating to (i) population by 5-year-age-group and gender (from UN 2017); (ii) labor force participation by 5-year-age-group and gender (from ILO 2017); (iii) unemployment by age (ages 15–24, 25+) and gender; and (iv) productivity (GDP per worker, calculated as a residual based on historic GDP estimates (from World Bank 2018), and assumed to converge over the projection).

[1] The method is summarized in the following simplified for a given year as: GDP = population by age × participation rate by age × (1-unemployment rate by age) × GDP per worker. See Chomik et al. 2015 for details.

Figure 4 Decomposition of GDP Growth: Future Headwinds and Potential



ITA = Italy, RUS = Russian Federation, JPN = Japan, FRA = France, DEU = Germany, UK = United Kingdom, CAN = Canada, US = United States, ZAF = South Africa, BRA = Brazil, MEX = Mexico, AUS = Australia, SAU = Saudi Arabia, ARG = Argentina, TUR = Turkey, IDN = Indonesia, KOR = Republic of Korea, IND = India, PRC = People's Republic of China.

Note: JP Par denotes participation scenarios reflecting Japan's by 2050.

Sources: Chomik, Piggott, and McDonald (2017), UN (2017), ILO (2017), World Bank (2018).

As shown in Figure 4, each factor contributes to the average annual changes in real GDP.[2] Between 1990 and 2017, the economies of the PRC, India, and the ROK grew the fastest, at between 5% and 10% per year; those of Italy, the Russian Federation, and Japan grew the slowest, at 1% or below.

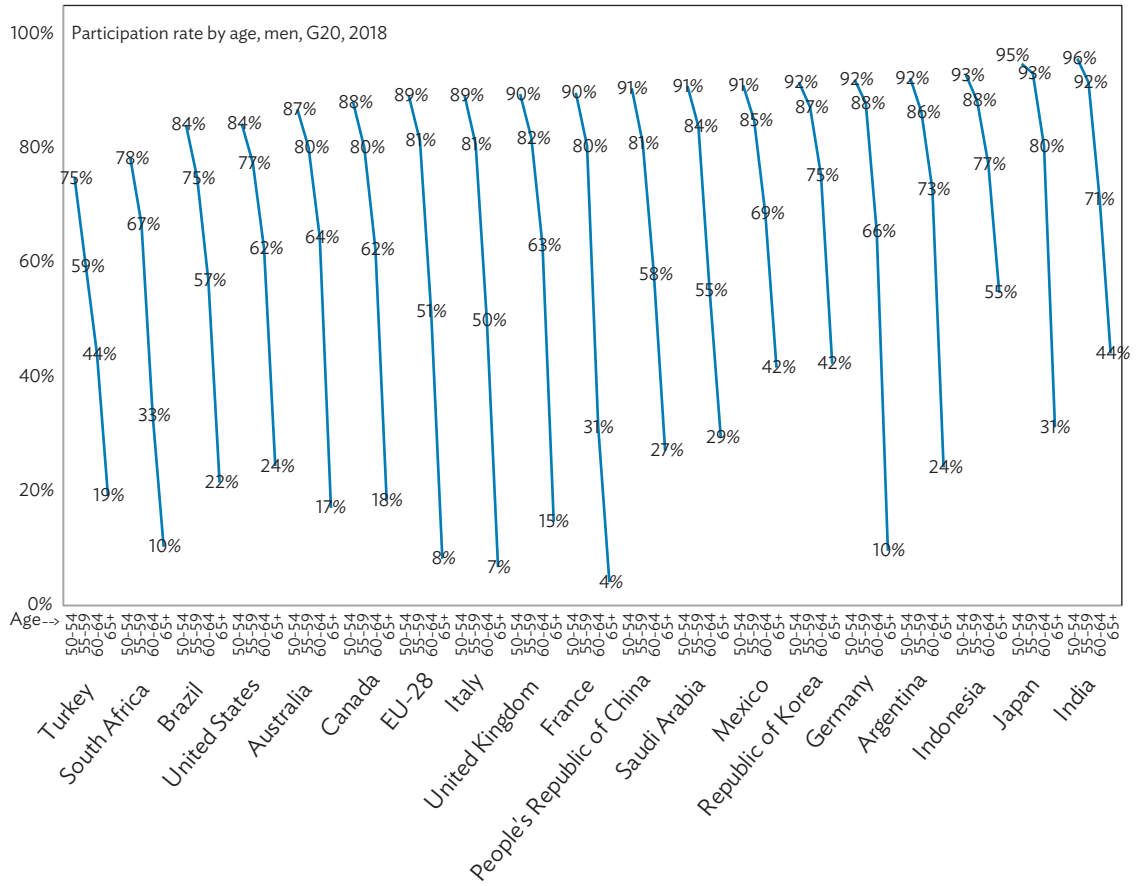
In future, economic growth across the G20 is projected to slow, from an (unweighted) average of 3.2% per year between 1990 and 2017, to 1.8% between 2018 and 2050. Those projected to grow the fastest, with rates of 3% or above, include India, Indonesia, and Turkey. The PRC is expected to slow dramatically by 2050; it is expected to have a modest average growth of 2.5% per annum over the period. The results illustrate how population was a strong contributor to economic growth in the G20 in the past, but that its impact will be less in the future and, in some cases, it will be negative.

Social security design can impact these outcomes. For example, if raising the access age to the pension increases labor force participation, then both pensions cost less and GDP increases. The third column for each country in Figure 4 shows projected real 2018–2050 GDP growth if the participation rate for those aged 55–64 increased to match the level seen in Japan. The outcome is an annual real GDP growth of 1.94% on average. Countries expected to benefit more are Italy, India, South Africa, Brazil, Saudi Arabia, and Turkey, with extra GDP growth of above 0.2%. This is because in some countries the participation of older workers drops faster

[2] We isolate changes in numbers of people, rates of participation, or rates of unemployment at a given age as effects of population, participation, or unemployment. The effect of productivity is any change in GDP not accounted for by other factors. How do population and participation effects differ? If, for example, the number of people aged 25–29 increases but the participation of this age group is constant, the increase in production will be entirely due to population changes and none will be ascribed to participation—even though more people are participating in the labor force. Participation effect is counted only when rate by age changes. This is in contrast to some approaches that conflate the two (e.g., Commonwealth of Australia 2015).

with age than in others (Figure 5). Similarly, improved health policies can impact productivity. In thinking about what structural features a sustainable social security policy might have, it is critical that it should be thought of not only in terms of moderating liabilities but also in terms of its impact on GDP. Finally, it is worth mentioning that a robust migration policy may help raise growth in smaller, aging countries. Such strategies would require various labor and social security protections and pension portability would need to be in place for migrants. As becomes apparent, well-designed social security systems can be sustainable and result in inclusive growth across the G20.

Figure 5 Mature Labor Force Participation: Balancing Protection and Adverse Incentives



EU = European Union.
Source: ILO (2017).

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Supporting Sustainable and Effective Social Security System Development in Aging Developing Countries

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Abstract

Population aging progresses also in developing countries and is likely to become a more serious policy issue in the near future. Because of the faster rate of aging, developing countries tend to be less prepared for a large elderly population, especially since their fast-expanding social security systems may neither be adequate nor sustainable. In an effort to promote the Sustainable Development Goals, the systematic support of the Group of 20 member countries will be necessary for the development of effective and sustainable social security systems in developing countries. In this regard, the Group of 20 members need to (i) support the establishment of a framework for developing countries to assess the effectiveness and efficiency of their systems, and (ii) provide technical support to developing countries in developing and implementing their own medium- to long-term frameworks.

Challenge

By 2050, the world's population aged 60 years and older is expected to reach approximately 2 billion, more than doubling in number from 900 million in 2015. The increasing number of aged people globally reflects aging demographic structures at the country level, and the economic implications of this demographic change have become a topic of global interest. The challenges from population dynamics seem more imminent in certain developed economies, and these countries have been leading the discussion on population aging and related policy issues thus far. However, population aging is not an issue confined to developed economies. In fact, by 2050, approximately 80% of people aged 60 or older are projected to be living in what are now low- or middle-income countries, and the impacts of population aging could be more detrimental in these developing countries. Most developing countries are not adequately prepared for the rapid aging of their populations and, more importantly, appropriate policy responses have yet to be widely explored.

- **Why is it more serious?** Population aging can pose a bigger risk to developing countries. First, the rate of population aging is often much faster in developing countries. With better medical services playing a key role, longer life expectancy and lower fertility rates are the two main drivers of population aging. The benefits of better medical services spread quickly nowadays, substantially increasing life expectancy and decreasing infant mortality, especially in low- and middle-income countries. Combined with the fall in fertility rates, some developing countries are facing an unprecedented rate of population aging. Second, social security in developing economies is either non-existent or at an early stage. With many

grand plans to expand these systems, they are often designed unsustainably, given the magnitude of the demographic challenges. Third, economic and financial institutions are less developed so that individuals are less prepared for the effects of increasing life expectancy.[1] With slow progress in financial development, old-age poverty will become a serious policy issue, reinforcing the need for the quick expansion of social security systems. In particular, resorting to the traditional way of family support is quickly losing ground as industrialization progresses in these countries (Martin and Kinsella 1994).

- **How are they different?** In developed economies, population aging and related policy issues are mostly linked to the potential growth slowdown with smaller working-age populations and unsustainable social security systems, with increasing numbers of retirees. In developing countries, on the other hand, the impact on potential growth can be less significant, considering that still the favorable labor force structure often outweighs the negative demographic effect. However, the financial sustainability of expanding social security systems is a major concern. In most developing countries, social security systems tend to expand faster, and a decision to expand these systems is often made without proper consideration of their effectiveness and long-term financial sustainability, which can exacerbate a country's long-term stability risk.

Proposal

These days, social security systems[2] are one of the key institutional elements in many developed economies to promote the welfare of the public. In developing economies, it is considered an important policy instrument to promote economic development and growth by reducing poverty, fostering social cohesion, and improving human capital (Bender, Kaltenborn, and Pfeiderer 2013; World Bank 2012; ILO 2012; European Commission 2012). Therefore, more countries are implementing and expanding their social security systems as an essential component of sound economic development, in line with the 2030 Agenda for Sustainable Development, but designing an effective and sustainable system remains one of the most serious policy challenges for these less-experienced countries. In particular, a rapid expansion of the system without proper sustainability considerations can significantly damage a country's long-term macroeconomic stability and growth potential.

As evidenced by many country experiences, policies enacted, even if found inappropriate afterward, are hard to correct, especially when many stakeholders are involved. Therefore, it is critical for developing countries to establish adequate and affordable social security systems from the start.

Given limited capacity and institutional constraints in most developing countries, we suggest that the Group of 20 (G20) members provide support to facilitate the development of sustainable and effective social security systems in developing countries in which populations are rapidly aging.

Recommendation 1: Support the establishment of a framework for developing countries to assess the effectiveness and efficiency of their social security systems

Although the number has improved substantially in recent years, only 45% of the world's population is effectively covered by at least one social protection benefit, and only 29% has access to a comprehensive social security system (ILO 2017). Given the current trends and global initiatives such as the United Nations' Sustainable Development Goals (SDGs), policy efforts to expand social security systems are expected to

[1] In many developing countries, the financial market is less developed, so that proper long-term investment and saving tools to prepare for retirement are not available. As the fast-changing economic environment quickly depreciates the value of their human capital, the majority has to depend largely on the traditional way of family support for their retirement, except for a small part of the population with formal sector pensions.

[2] To simplify the discussion, this proposal uses the term "social security system" in a broad sense, inclusive of "social protection systems" with means testing.

continue, especially in low- and middle-income countries. In addition, countries with aging populations will face higher pressures to expand systems from growing social issues such as old-age poverty, inequality, etc.

However, even though a system may have been implemented does not necessarily imply that it is properly designed to provide the necessary protection in a financially sustainable way (Asher 2010). With the progress seen in the development of social security systems, the effectiveness of systems is an important point that needs careful examination. Despite a noticeable improvement globally, their impact on poverty (measured in terms of inequality, poverty headcount, and poverty gap) reduction is found to be considerably less significant in low-income countries (World Bank 2018).[3]

The efficiency of the systems is another important aspect to be considered in policy design. Despite being implemented more recently, social security systems in low-income countries are found to be relatively more costly, covering a substantially smaller part of the population and providing less significant benefits than those in high-income countries.[4] According to the World Bank (2018), high-income countries spend 1.9% of GDP on average to provide social protection to 81% of the population, while low-income countries spend 1.5% of gross domestic product on average to cover only 18% of the population. Improving this low coverage and still relatively low benefit levels is a key policy direction to enhance social security systems in many developing countries. The biggest policy challenge in this aspect is maintaining the long-term financial sustainability of the systems, which can be more serious in countries with aging populations.

Although the need for better social protection is still high in many low- and middle-income countries, there also exists doubt about those countries' capacity to implement social security systems properly. Indeed, recent statistics show that the social security systems in low- and middle-income countries have been developing in a less efficient and less effective way, and the continued expansion of the current systems could pose serious risks to the long-term sustainability of economic development. Therefore, before this risk emanating from the continued expansion of the social security system materializes in some countries, coordinated efforts are necessary to complement the promotion of SDG implementation toward more efficient and effective social security system development.

In particular, the G20 members need to lead in establishing an assessment framework readily available for low- and middle-income countries to assess the effectiveness and efficiency of their systems, and promote more informed policy decision-making to ensure the system's long-term sustainability. Additionally, developed economies should promote technical assistance in the system design, tailored to individual countries.

Challenges of a fast-aging population also need to be assessed in this framework. Noting that unfavorable demographic changes have not yet received an adequate level of public attention in most developing countries, such an assessment framework needs to provide credible groundwork to facilitate system adjustments in a proper way with greater public support.

[3] They explain this result is partly due to insufficient data in low-income countries.

[4] The efficiency of social protection is closely linked to cost containment while maintaining an adequate level of benefits distributed to people. In developing countries, however, the distribution of benefits can be relatively costly because the benefit distribution network is often still at an early stage of development. In addition, owing to a relatively large informal sector and informal income sources, social security systems usually cover only a small portion of the population and a small portion of their whole incomes.

Recommendation 2: Encourage technical support to developing countries in developing and implementing long-term policy frameworks

SDG 1.3 instructs countries to "implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable."[5] As discussed, social security systems have been expanding quickly in recent decades, and establishing effective and affordable systems has become of key importance to policy makers, especially in countries with aging populations. Obviously, a proper design of the systems is a crucial element in ensuring efficiency and sustainability. However, this requires a careful analysis of long-term dynamics of the systems together with the progress in economic development, which can be particularly challenging in low- and middle-income countries. Additionally, there are many practical constraints—such as the lack of appropriate data for reliable long-term projections and actuarial calculations, hard-to-predict structural changes along the development path, and labor market projections.

In addition, public resource management in low- and middle-income countries is usually carried out in an annual framework and often lacks a longer-term perspective. Although many development plans and strategies are available covering longer terms, corresponding plans on the fiscal side are often neglected or set unrealistically. Extending the fiscal policy time horizon is a key first step, but human resource constraints and institutional constraints have to be resolved first to make meaningful progress on this front.

Public support is a key ingredient in policy making and a myopic policy discussion framework is a problem related to the public as well. Often, without any proper analysis of the possible impacts on a system's long-term sustainability, expanding the social security system remains an attractive option for many politicians. Such expansion of the system will continue as long as the public provides strong support, and this often renders the system even more unsustainable. On the contrary, reform toward a sustainable and effective social security system can also leverage strong public support. The challenge for developing countries is that the public in general is less informed and sometimes even less concerned about the system's sustainability. Even if the sustainability of a social security system is not a popular issue of discussion in a country with an aging population, proper information and reliable analyses are indispensable basic elements to gaining more public support for a sustainable and affordable social security system.

In developing countries, diverse practical constraints often lead to a "gradual" approach in the implementation of a poorly designed system. The gradual implementation of social security can reduce the risk of damage from policy mistakes but may also slow down progress in social issues that the system is intended to address. On the other hand, a poorly designed system without proper analysis may not be as effective and may jeopardize the long-term sustainability of the system. In either case, institutional arrangements for well-informed decision-making can substantially improve the development path of the country. However, such institutions are not easy to establish.

Developed countries have decades of experience with social security systems, while developing countries need to establish the underlying analysis framework for their own systems. Although policy focus may be different across countries, developed countries' support will likely greatly improve developing countries' institutional capacity to properly approach the issue from a long-term perspective. In addition, the G20 member countries can help the authorities' reform initiatives to promote public awareness on the importance of the adequacy of the social security system and the financial sustainability of the system, so that policy discussions are properly guided with appropriate public pressure.

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[5] SDG 1 commits all countries to ending poverty, protecting the planet, and ensuring prosperity for all. The key to achieving this is the pledge to "Leave No One Behind", which includes people of all ages. The SDGs will only be successful if older people's rights and needs are taken fully into account.

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The Role of the G20 in Designing Immigration Policies to Support Population Aging

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Abstract

The world's foremost developed economies are undergoing a demographic shift toward older median ages. As a by-product, this also indicates the slowdown of economic growth. While this shift has encountered numerous policies, welcoming immigrants from younger societies remains critical for mitigating the consequences of aging populations. Newcomers, however, tend to be less educated than their locally born counterparts and require the development of skills prior to their departure. Unfortunately, the current practices of skills development have been small scale and limited to selective immigration policies of a few countries. Pivotal economies necessitate a work force with diverse skill sets. Therefore, aging economies require an educated labor force whose potential members could be economic migrants or forcibly displaced individuals.

Challenge

Generating regional and global imbalances for two reasons, population aging is poised to become one of the most significant social transformations of the 21st century. First, there is the declining fertility rate. The world's post–World War II fertility rate was 4.9 children per woman from 1950 to 1955. Today, the rate has declined to 2.4 and projections for 2050 estimate 2.3 children per woman (UN 2017). In close second, juxtaposing this reality is the increasing life expectancy. Globally, since the 1950s, people are living 3 decades longer. Life expectancy by 2050 is estimated to be 76.9 years, up from 46.9 years in 1950–1955 (UN 2017). The changes in fertility and life expectancy rates set the stage for this global demographic transition: the number of individuals aged 60 and above was 962 million, or 12% of the world population, in 2017. In 3 decades, by 2050, the number is expected to double and reach 2.1 billion, or 21% of the world population.

The transition from high mortality–high fertility to low mortality–low fertility overtly will reflect itself in taxation. This shift unfolds in two ways. Governments' public spending on age-related programs, such as pensions and health, as a share of gross domestic product (GDP), will rise. Indeed, in more developed countries, the combined spending on pensions and health could increase from 16.4% in 2015 to 21.4% by 2050. Comparatively, government spending in less developed countries will also increase from 5.5% to 10.0%, leading to unsustainable public debts. This, in return, will entail either budget cuts, for example, on education or infrastructure spending, or will require a spike in taxes that would hinder economic growth. The slowdown of the economy would make it further difficult for governments to reduce their public debt as the share of GDP as these issues increase (Clements et al. 2015). All these are accompanied by greater asset accumulation coupled

with lower interest rate. The decrease in the latter would negatively affect the acquired savings of the aging population while dissaving to meet mostly health-related expenditure (Carvalho, Ferrero, and Nechio 2016).

The demographic shift has expanded labor market participation by increasing the age of retirement (Bloom et al. 2006) and has elevated the participation of females (Bloom et al. 2009). What is more, aging populations saw more investment in human capital. School enrollments and educational attainment have improved across countries as parents invest in fewer but exceedingly more educated children (Lee and Mason 2010). Additionally, automation, specifically robotics, is gaining ground to offset the consequences of sizable generation aging. To note, a positive productivity spillover of adopting robotics is still, unfortunately, limited to select industries that benefit from automation (Acemoglu and Pascual 2018).

Migration remains vital in relieving the strain of population aging and reveals long-term gains, such as higher growth and productivity (IMF 2016). While immigrants' labor market outcomes are indicators of successful integration in the receiving economies, the success, nevertheless, faces hurdles. The most noticeable one is the mismatch between immigrants' skills, qualifications, and jobs in hosting economies (Aleksynska and Tritah 2013). These hurdles find root in, but are not limited to, immigrants' difficulty in the transferability of their human skills (Chiswick and Miller 2009), quality of education in countries of origin (Bratsberg and Terrel 2002), and economic conditions in destination countries (Sattinger 1993; Boeri and Jimeno 2005; Bentolia and Bertola 1990).

Proposal

Adopt and Implement Flexible Immigration Policies

The robust economies of the industrialized nations create jobs, but the supply and demand of labor are skewed because of the rising potential support ratio.[1] The potential support ratio in African countries, on average, is 12.9 people aged 20 to 64 for every person aged 65 or above. This figure is 8.0 in Asian countries, 7.6 in both Latin America and the Caribbean, 4.8 in Oceania, and under 4 in both Europe and Northern America. Japan has the lowest potential support ratio in the world with 2.1. Projections for 2050 indicate that many countries, especially European ones, are expected to have a potential support ratio below 2, underlining the fiscal pressure that health care systems as well as the old-age and social protection systems of many countries will likely encounter in the near future (UN 2015).

Therefore, alongside the aforementioned outcomes of population aging in the labor market, the call for aging developed economies remains open to adopt and implement immigrant-friendly policies (IMF 2018). Indeed, developed economies are keen on welcoming more immigrants. Take Germany for example, Europe's highest-ranked economy ended 2017 with over 1.2 million job openings, the highest since the reunification of the country.[2] This was coupled with an unemployment rate as low as 3.75%. There is a similar case in Japan as well. New job openings for general employment stood at 966,635 in November 2018 (Japan Ministry of Health, Labour, and Welfare 2018). The Asian giant currently boasts one of the lowest unemployment rates in the world: 2.2% at the end of 2018. In certain sectors, such as construction and nursing care, job vacancies are four times higher than the available human capital. In both countries, there is a shortage of manpower. Moreover,

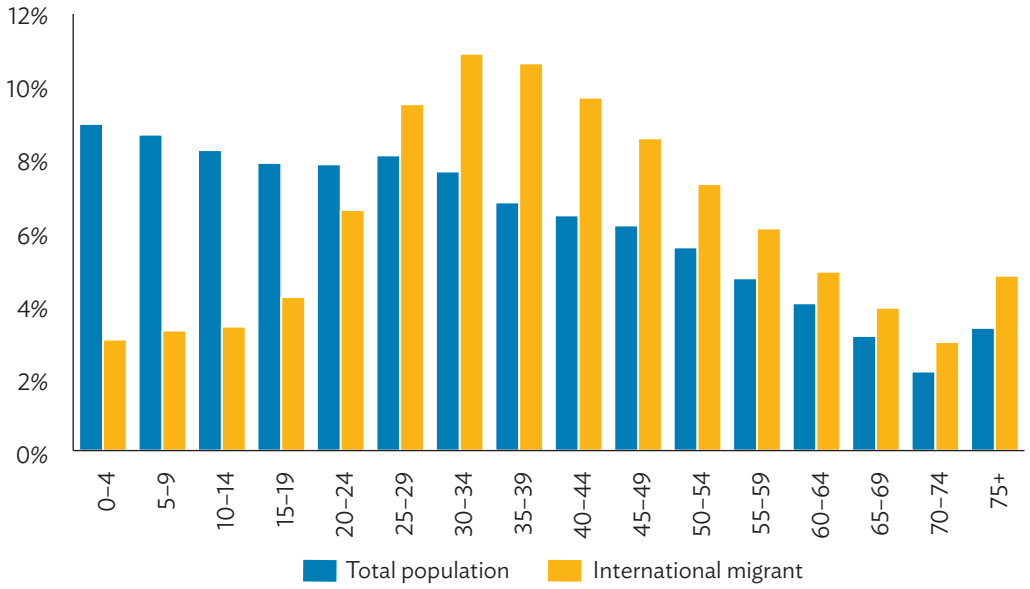
[1] Potential support ratio: the number of people aged 20 to 64 divided by the number of people aged 65 and over. The United Nations Department of Economics and Social Affairs, Population Division.

[2] German job vacancies hit a record high in the second quarter. Reuters. 2018. https://www.reuters.com/article/us-germany-economy-vacancies/german-job-vacancies-hit-record-high-in-second-quarter-idUSKBN1KS0ZN.

the labor market in Germany needs around 440,000 immigrants, with various sets of skills to fill jobs which the local labor supply cannot fulfill (Lall 2019). Japan needs 345,150 blue-collared workers.[3]

Experience suggests that migration offers a multitude of economic gains with limited negative spillovers. With regard to the latter, there is an undesired impact on the wages of low-skilled workers (Aydemir and Borjas 2007). Yet, the overall impact of immigrants on employment and wages of natives remains limited (Peri 2014). On the other hand, immigration increases the share of working-age people in the total population (Figure 1). Harvesting the potential of young newcomers depends, however, on swiftly integrating them into the labor market (Aiyar et al. 2016). In addition, diverse workforces suggest a large benefit on the income per capita of host economies (Alesina, Harnoss, and Rapoport 2016). This, specifically, is a critical long-term gain for economies with aging populations.

Figure 1 Age Distribution of the Total Population and International Migrants, 2017



Source: United Nations, Department of Economic and Social Affairs, Population Division, International Migration. https://www.un.org/en/development/desa/population/migration/data/estimates2017/estimates17.asp (accessed 8 March 2018).

Immigrants also expand the upward mobility of natives in the labor market, often performing more complex tasks that promote skill upgrading and, hence, foster efficient specialization. As is the case in Turkey today, the sheer influx of Syrians created higher-wage formal jobs and enabled occupational upgrading of Turkish workers who now enjoy higher average wages (Del Carpio and Wagner 2015). Furthermore, immigrants increase the wider participation in the labor market, particularly among highly skilled native women when there are lower-skilled female labor migrants (Jaumotte, Koloskova, and Saxena 2016). Additionally, immigration increases

[3] Japan Times. 2018. Japan to regularly release figures for foreign workers by region and sector under new visa system. https://www.japantimes.co.jp/news/2018/12/20/national/japan-regularly-release-figures-foreign-workers-region-sector-new-visa-system/#.XFFbjVUzbIU.

demand, which tends to boost consumption in the short term and investment over the medium term (Alesina Harnoss, and Rapoport 2016).

Immigration may foster innovation in the form of introducing new goods. After the arrival of immigrants, estimates indicate that a twofold increase in the migration stock is associated with a 60% increase in the likelihood of exporting a new product within 10 years (Bahar and Rapoport 2018). The overall relationship between immigration, investment, and trade appears to be strongly positive (Hatzigeorgiou 2010).

Moreover, developed economies, due to their favored destination status, are keen on promoting selective immigration policies. This approach pushes potential immigrants to increase their educational threshold and develop necessary skills to meet acceptance criteria. (Bertoli and Brücker 2011). Yet one consequence is the disproportionate concentration of skilled immigrants in these destination economies. Indeed, countries of the Organisation for Economic Cooperation and Development (OECD) are home to two-thirds of skilled immigrants; among them, the United States (US), the United Kingdom, Canada, and Australia are the top destinations (Goldin et al. 2018). Any given economy, nevertheless, does not run only on the skilled individuals. History shows that the US has hosted close to half of all highly skilled migrants to the OECD and one-third of highly skilled migrants worldwide (Kerr et al. 2016). However, sectors like agriculture, in-home health care providers, and au pairs are not in the interest of the local population and the vacuum can be occupied by migrants (Wilkinson 2018).

Develop Forced Immigrants' Skills in Host Economies

Although migration can make an important contribution to labor force growth, its role in counterbalancing the effects of population aging will depend on the capacity of countries to match labor needs to migrants' skills. In this regard, more needs to be done to better use migrants' skills and to adapt labor migration management systems to employers' needs.

There have been a number of initiatives, mainly driven by the private sector, and in certain cases with government support, for skills development while targeting new hires in immigrants' countries of origin. There are, for example, technical training programs in the maritime and construction sectors of the Philippines and Bangladesh, respectively. Other initiatives also include training Mexican nurses to work in the US and for Tunisians to work in Germany. Viet Nam also has a similar training scheme for geriatric nursing. These programs not only foster skills development but also language and cultural orientation. Successful candidates receive certificates recognized by the host nation, acquire special visas by the destination economies, and their finances are covered either by private sector actors or under private–public partnerships (Clemens 2015).

Recommendations

The mobility of humans in today's world is driven by regional and global economic imbalances. Developed economies enjoy budget surpluses due to asset accumulation and low interest rates that further empower the already powerful, and consequently further generate generational inequalities within national economies. In the face of this, less developed economies struggle with budget deficits that motivate millions of their citizens to look for opportunities elsewhere.

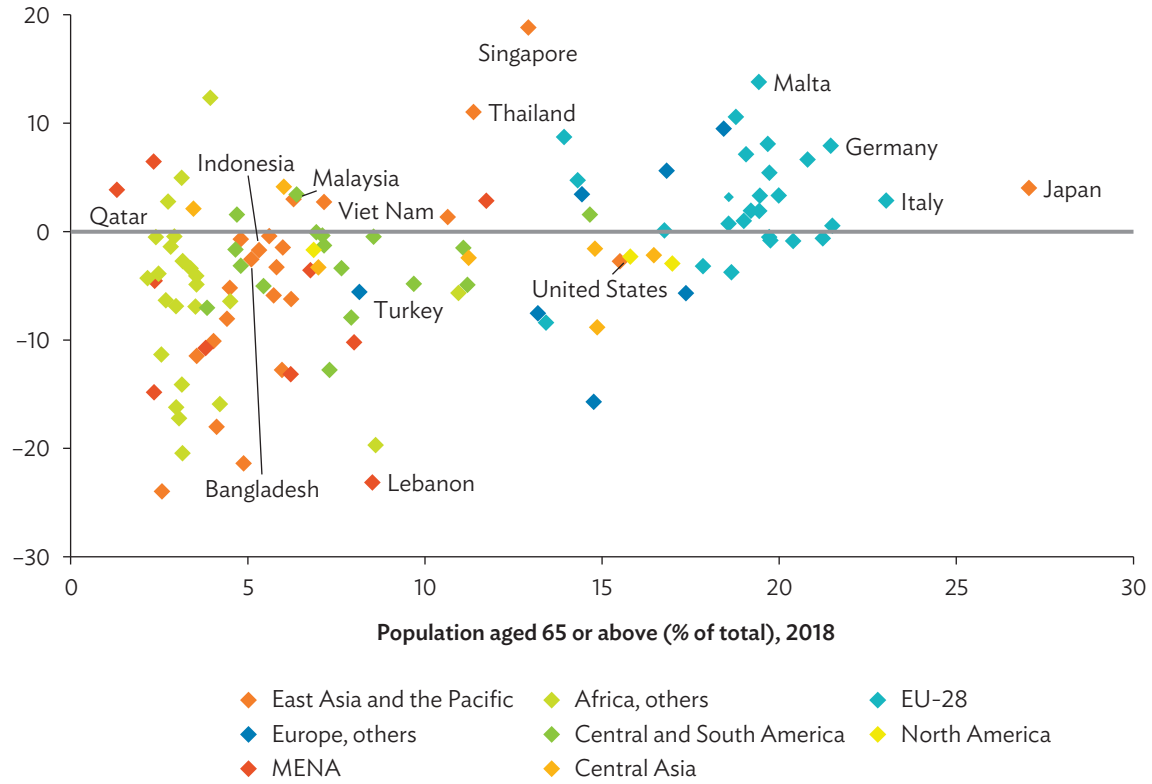
Thus, it would be of mutual benefit to channel some of the surplus existing in the developed economies to create a global wealth fund. This could flush capital in certain investments along the lines of the Sustainable Development Goals by targeting destinations where younger generations of locals and others could counterbalance the envisioned negative consequences of the demographic shift.

Appropriate to the initiative, the global wealth fund could consider the formerly mentioned skills development schemes as a springboard initiative. The latter, as an upscaled version of what had been discussed, could target, as an example, globalized economies with an intake of sheer numbers of immigrants for enhanced responsibility sharing. Moreover, the platform for the initiative would be the Made by Refugees (MBR) special economic zones—an initiative that promotes investments in designated zones to support inclusive employment opportunities for the hosting community and newcomers (Kadkoy et al. 2017).

The Group of 20 (G20) should develop the MBR framework as a commercially viable business model for multinational companies (MNCs) and local small and medium-sized enterprises (SMEs) and move past the corporate social responsibility programs. For SMEs that subcontract orders from MNCs in refugee-hosting countries, an MBR zone would bring greater transparency and accountability from local firms that employ refugees. As such, the creation of decent jobs through establishing MBR zones would help prevent the exploitation of refugees, including children.

The G20 could utilize the saving surplus of population aging (Figure 2) to invest in developing the already-existing infrastructure of MBR zones. The investment of the G20 countries would be proportionate to the amount of labor shortages present in the national economies, while considering the costs of resettling

Figure 2 Current Account Balance (% of GDP), 2018



EU = European Union, MENA = Middle East and North Africa.
Source: UN (2017).

immigrants and the sophistication of the skill sets to be developed (Düşündere et al. 2018). In parallel, the G20 should encourage intimate dialogue with the private sector in order to create public–private partnerships and facilitate procurement contracts for the companies in the zone. Hence, the return of the investment would be relative to the invested capital.

By following this path, the G20 would turn the forced immigrants in refugee-hosting countries to skilled immigrants. They would become politically and publicly more acceptable and, most importantly, they would be prepared to fill the vacancies in needed economies. Hence, safeguarding the pensions of the elderly as the newcomers emerge to become taxpayers—effectively and gradually motivating the central banks in respective national economies to raise the interest rate and protect the savings of the elderly.

The G20, through the MBR initiative, would act on responsibility sharing while developing the skills of forced migrants. Forced displacement immigrants tend to seek safety in neighboring countries, leaving very few hosting countries with the task of accommodating millions (UNHCR 2017). Therefore, the MBR initiative would correspond to the durable solution proposed by the United Nations High Commissioner for Refugees by offering local integration through the jobs created in the zones of hosting economies; offering resettlement opportunities for the trained immigrants after being equipped with the necessary skills to effectively participate in the economy of the destination countries; and contribute to skills upgrading when the immigrants decide to repatriate and take a role in rebuilding their home countries.

Finally, jobs created through MBR zones would be desired jobs (i.e., formal employment opportunities in line with modern occupational safety and health standards); sustainable jobs (i.e., they would require profitable business models for the operating companies); and inclusive jobs (i.e., they would be directed at both host and refugee communities to ensure a fair distribution of generated income from the MBR initiative).

If population aging is not appropriately addressed, the result of a stagnant economy would destabilize developed nations. Migrants, seeking opportunities globally, can be utilized as a beneficial human capital resource and as an antidote for consequences facing developed G20 economies. Policies must be enacted to enhance the integration of migrants into host nations while keeping economic growth at a stable pace.

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Investment in Social Capital and Migrant Labor as a Labor Policy Alternative in Countries with High Population Aging

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Abstract

Population aging has become a global concern for most economies due to the implications it has on labor market dynamics and economic development. Aging results in increased expenditure on health and welfare services, yet the labor force shrinks and is unable to match available labor market opportunities, with detrimental results for production and productivity. Internal policy solutions such as increasing the retirement age and increasing working hours have proved unsuccessful in many countries. There is therefore a need for comprehensive policy actions that integrate internally oriented and externally oriented solutions such as revision of migrant labor and tap into social capital policies.

Challenge

An aging population in any country poses a threat to productivity and economic participation by local residents, thereby creating a need for immigration policies that open doors for economically active migrants who can participate in building the economy. In the Group of 20 (G20) countries such as Japan, medical advancements have resulted in an increased life expectancy of about 84 years[1] in a country where the birth rate is as low as 1.4 births per woman.[2] Population aging projections for 2030 estimate that in Japan, for example, there will be only one child under 15 for three adults over 64. Figure 1 presents population-aging projections for 2030 in five big economic players.

The figures clearly show that the aging process is accelerating, with the number of old people expected to double by 2030 across the globe, including in the G20 countries. Although an aging population is considered a success story in the history of humankind, Genda, Teruyama, and Ohta (2007) posit that it has repercussions for labor market dynamics and social welfare expenditure on the elderly. These countries face the challenge of a reduced labor force, with detrimental effects on productivity as noted in Branka (2016). This is because as people get to retirement age, there are not enough working-age people to fill the vacant positions.

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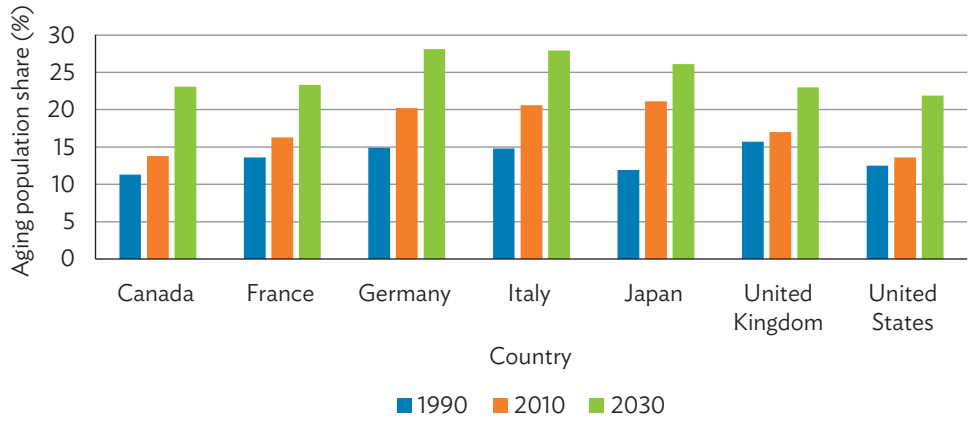
1 World Bank. Life Expectancy at Birth, total (2014). http://data.worldbank.org/indicator/SP.DYN.LE00.IN (accessed 29 Jan 2019).
2 World Bank. Fertility Rate, total (2014). http://data.worldbank.org/indicator/SP.DYN.TFRT.IN/countries (accessed 29 Jan 2019).

Figure 1 Population Projection for 2030



Country	Canada	France	Germany	Italy	Japan	UK	US
1990	11%	14%	15%	15%	12%	16%	13%
2010	14%	16%	20%	21%	21%	17%	14%
2030	23%	23%	28%	28%	26%	23%	22%

Source: United Nations, Department of Economics and Social Affairs (UN DESA). 2015. World Population Prospects: The 2015 Revision.

In many of the countries with aging populations women tend to live longer than men, and therefore their participation in the labor market would be an ideal solution. However, there are socio-cultural constraints that bar them. According to Tilly and Scott (2013) in most societies gender continues to be a barrier to women's participation in the labor force while in countries like Japan it is traditionally usual to find women in domestic domains and not in the labor force (Branka 2016). The situation is reportedly exacerbated by the shortage of day-care workers if women go to work. This comes on top of the widely acknowledged physical barriers like childbearing for women (Sakuragawa and Makino 2007).

Inward-looking solutions, such as increasing the retirement age, increasing working hours, and increasing the proportion of women in the workforce, have proved to be unsuccessful, necessitating outward-looking solutions that open up migration policies to allow foreigners to go into a country and work. The failure to develop appropriate immigration policies will create difficulties in economies that need to sustain social safety net programs.

Proposals

Management of costs associated with aging

The existence of population growth and aging societies is unavoidable, and it comes at a cost to any economy. Therefore, G20 countries have to develop policies that favor investment in social capital to grow their economies as well as care for the aging population (Thompson 2010). There is a lack of consensus in conceptualizing and measuring social capital (Coleman 1990, 2000; Dah and Zolnik 2011; Tundui and Tundui 2013), but this policy brief adopts Kim's and Sherraden's (2014) approach to social capital, which

conceptualizes it as consisting of informal networks of friends, family, relatives, and work groups that could provide economic benefits and resources to both the host and sending countries (Khan et al. 2013; Kim and Sherraden 2014). In particular, the bridging social capital networks can potentially bring the networks of the host and sending countries together, thereby bringing more resources and wider contacts between the two networks (Eraydin, Tasan-Kok, and Vranken 2010). Investing in these social capital networks therefore benefits the economy of a country.

Some examples of investments in social capital among the G20 countries have focused on long-term insurance to provide care at old age for local populations. These include the statutory long-term care insurance financed by compulsory contributions provided by Germany. Japan is also considering public long-term care insurance that will take care of those at old age. (World Bank 2015). While such investments may address the problem of dependence on the state by an aging population, they do not solve the labor market deficiencies that arise out of aging populations.

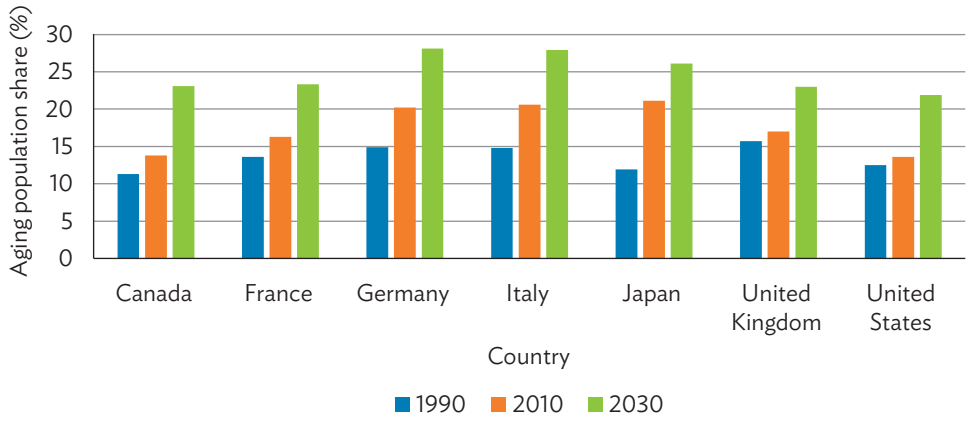
G20 countries will therefore benefit from developing policies that tap into migrant labor as a potential social capital that can bring in more resources to the host country. Such policies should make it possible for migrant labor to access the labor market, and to receive the same benefits of long-term insurance as locals, in recognition of their contribution to the economy and to attract their long-term retention in the market.

Planning through a social capital lens

Industrialized countries, including Japan, are experiencing rapid population aging and shrinkage. In Japan, for example, it is projected that population will decline by 25% between 2015 and 2050. The elderly dependency ratio will remain the highest at 73% in 2050 compared to the Organisation for Economic Co-operation and Development (OECD) average, which was at 44% in 2015 (OECD 2017a). The implication is that population aging will increase spending pressures and exacerbate Japan's fiscal problems. Age-related spending on pensions and on health and long-term care is projected to rise by 7% of gross domestic product between 2020 and 2060 (OECD (2017b). Aging also has seen Japan facing its largest labor shortages since the 1970s. When age-specific labor force participation rates remain constant, the labor force will reflect the smaller, older population, and the rate of decline in the labor force will tend to exceed the rate of population decline and affect the rate of economic growth (Sakuragawa and Makino 2007). Thus, to address the situation, there is a need to plan through a social capital lens. The latter implies making use of all available talents that promote the inclusion of women, the elderly, youth, and foreign workers in the labor market (OECD 2017c). Figure 2 overviews annual net migration in selected developed and developing countries.

The G20 countries have experienced high volumes of immigrants and Japan accounts for 0.6 per 1,000 inhabitants. Japan has seen the number of foreign workers in employment going up by about 20% annually between 2010 and 2015. The indication is that employers are willing to incorporate foreign workers into their labor force. Some of the envisaged benefits of incorporating foreign and local-born workers might be that the two groups perform complementary tasks. According to Piper and Ball (2001), where some unskilled or semi-skilled jobs in the manufacturing, transport, health, catering, and construction sectors in Japan become unattractive, migrant labor complements the labor market by being involved in these sectors. This complementarity can increase the productivity of local workers, generating positive results for their employment and wages. The World Bank (2015) reported that foreign labor in developed countries has diverse skill sets they bring which can result in large multiplier effects.

Figure 2 Annual Net Migration Rate per 1,000 Inhabitants, 2010–2015



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Source: United Nations, Department of Economics and Social Affairs (UN DESA). 2015. World Population Prospects: The 2015 Revision.

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Financial Literacy, Incentives, and Innovation to Deal with Population Aging

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Abstract

One of the challenges that population aging poses is to ensure that people have an adequate level of savings for old age. While individuals are increasingly being asked to take more responsibility for their old-age savings, the evidence suggests that low levels of financial literacy are prevalent across the world and that the effectiveness of financial incentives that are offered to encourage people to enhance their retirement savings seems limited. We propose a number of policies that address these challenges with the aim of ensuring the financial well-being of the elderly in their retirement.

Challenge

Population aging is now a pressing issue not only for developed countries but also for developing countries. In particular, in many countries in Asia, population aging is progressing at an unprecedented rate and is occurring at a relatively early stage of development, which gives these countries limited time and opportunity to prepare themselves for the needs of an aged society.

One of the challenges that population aging poses is **the adequacy of saving for old age**. While public pension programs continue to play an important role in people's old-age saving in most developed countries, the fiscal sustainability of such programs is increasingly being challenged as a result of population aging. In response, governments have been introducing measures that encourage individuals to take more responsibility for securing their financial well-being in old age, but there remains room for further efforts. Moreover, increases in life expectancy are making it harder to ensure the adequacy of old-age saving. Turning to the case of the developing world, many emerging and developing countries are not yet equipped with adequate systems of public pensions, and people continue to rely largely on family support for their old age.

Another issue that is related but at the other extreme is **the slower-than-expected wealth decumulation rate of the elderly** observed in many countries across the world. Indeed, a growing literature examines why the elderly tend to hold on to their wealth into very old age, and several alternative explanations have been put forward to explain this puzzle, including precautionary saving and bequest motives.[1] For example, using

[1] See De Nardi, French, and Jones (2016) for a useful survey of the literature.

data on Japan, Horioka and Niimi (2017) and Niimi and Horioka (2019) find that it is due more to saving for precautionary purposes arising from life-span uncertainty and uncertainty about future medical and long-term care expenses than to saving for bequest motives. One important implication of such a phenomenon is that the well-being of the elderly is being adversely affected because they cannot enjoy as high a standard of living as they can afford because of their perceived need to save for precautionary purposes. The consumption and saving behavior of the elderly has profound macroeconomic implications, and its importance will increase given that the share of household wealth held by the elderly will invariably increase along with population aging. For example, in Japan, the most aged society in the world, almost 70% of total financial wealth is held by households whose heads are aged 60 or above and more than 90% of total financial net wealth is held by such households.[2]

Proposal

One of the solutions we propose for the above challenges is to enhance people's financial literacy to help them better plan for retirement. Other solutions include financial incentives that encourage individuals to be better prepared for old age and financial innovations that allow the elderly to decumulate their wealth more rapidly without sacrificing their peace of mind. Implementing these proposals would enable the elderly to enjoy a comfortable and worry-free retirement in the face of population aging.

Proposal 1: Enhance financial literacy

The importance of having an adequate level of financial literacy has been widely recognized and emphasized across the world in recent years. Its importance in the context of ensuring the adequacy of saving for old age is no exception. Van Rooij, Lusardi, and Alessie (2012), for example, provide evidence of a strong association between financial literacy and the level of wealth. They identify two channels through which financial literacy may facilitate wealth accumulation: (i) it increases the likelihood of investing in the stock market, allowing individuals to benefit from the equity premium; and (ii) it is also positively related to retirement planning, and having a savings plan helps individuals accumulate wealth. Given that the fiscal sustainability of public pension programs is being challenged as a result of population aging, individuals are being increasingly encouraged to take more responsibility for managing their own retirement saving, mainly through a general shift from defined-benefit to defined-contribution pension plans. Indeed, a growing number of products are being offered for retirement saving by increasingly complex financial markets. Thus, having an adequate level of financial literacy is becoming more important than ever.

Recent years have witnessed growing efforts to assess the levels of financial literacy of the population. For instance, the Organisation for Co-operation and Development (OECD) International Network on Financial Education (INFE) has developed a survey instrument that can be used to measure financial literacy. Its core questions cover financial knowledge, behavior, and attitudes that are thought to be necessary to make sound financial decisions and ultimately achieve individual financial well-being (OECD 2017a). According to the findings obtained by the OECD/INFE survey, on average, fewer than half (about 48%) of adults in the Group of 20 (G20) countries could answer 70% of the financial knowledge questions correctly (the minimum target score) (Figure 1). Similarly, a growing literature on financial literacy underscores the fact that low levels of financial literacy are prevalent across the world (Lusardi and Mitchell 2014). Moreover, women are found to have less financial knowledge than men. On average, only about 43% of women in the G20 countries achieved the minimum target score, while about 54% of men did so (OECD 2017a).

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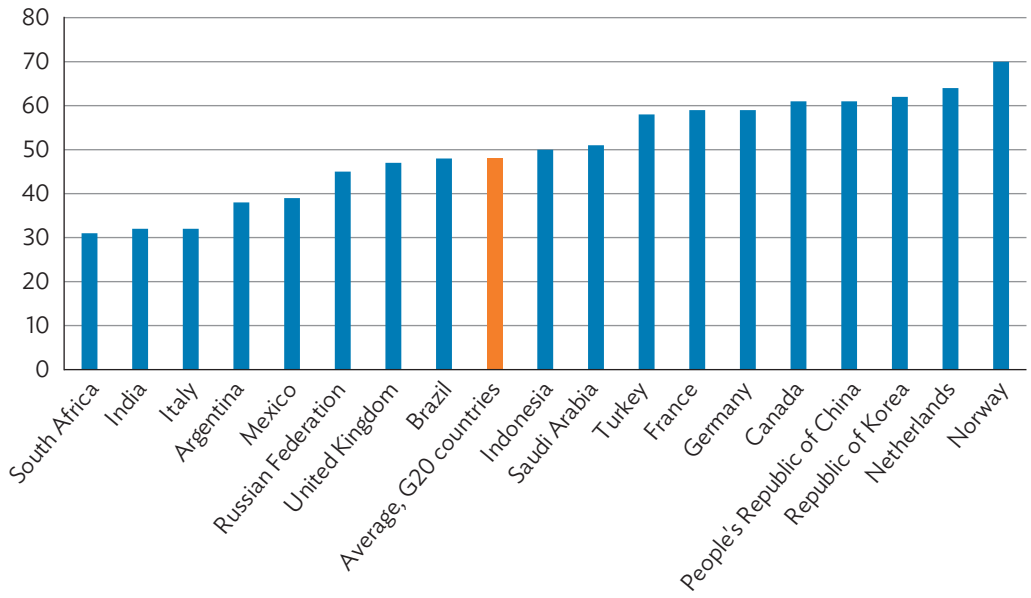
[2] Based on data on two-or-more-person households from Japan's Statistics Bureau, Ministry of Internal Affairs and Communications. Annual Report on the Family Income and Expenditure Survey, Volume II: Savings and Liabilities, 2017 edition (http://www.stat.go.jp/data/sav/2017np/index.html).

Figure 1 The Share of Respondents Achieving the Minimum Target Score on Financial Knowledge (%)



Note: "Average, G20 countries" reports the mean of the country percentages for all G20 countries with comparable data (excluding the Netherlands and Norway). Each country is given equal weight.
Source: OECD (2017a).

To address the prevalence of financial illiteracy across the world, we propose the following three policies:

Policy 1: Ensure that people have an equal opportunity to access financial education at a young age.

Policy 2: Enhance concerted and coordinated efforts among the authorities responsible for education, financial regulatory authorities, and the private sector (financial institutions) to develop appropriate financial education programs.

Policy 3: Enhance our understanding of the effectiveness of financial education at school so that it can be better designed and delivered in a more efficient and effective way.

One way of enhancing the general level of financial literacy in the long run is to ensure that people have an equal opportunity to access financial education at a relatively early stage of their lives. In response to the recognition that basic financial literacy is an essential life skill, the OECD's Programme for International Student Assessment (PISA) has been assessing the financial literacy of 15-year old students since PISA 2012. According to PISA 2015, far too many students around the world were found to be failing to attain a baseline level of proficiency, suggesting that greater investments in financial literacy from a young age are needed (OECD 2017b). However, to develop and design appropriate financial education programs, concerted and coordinated efforts among the key stakeholders, including the authorities responsible for education, financial regulatory authorities, and the private sector (financial institutions) are needed. At the same time, we still know too little about what should be taught in financial education and how and when it should be delivered to children. We therefore need to conduct more empirical analyses of the effectiveness of existing financial

education programs, identify good (and bad) practices across the world, and encourage countries to share their experiences so that financial education can be better designed and delivered in a more efficient and effective way.

Proposal 2: Improve the design of financial incentives to save for retirement

The provision of financial incentives has long been a common tool for governments to boost saving, and the promotion of saving for old age is no exception. In light of the growing problem of the fiscal sustainability of public pension programs due to population aging, governments have been introducing various financial incentives to enhance participation in, and contributions to, retirement saving plans to complement public pensions and to enhance overall saving for old age, thereby making people take more responsibility for their financial well-being after retirement. Financial incentives generally take the form of both tax incentives and non-tax incentives. Tax incentives, the most common type of such measures, provide favorable tax treatment to retirement saving compared to other types of saving, while non-tax incentives, which are more recent, include matching contributions and fixed nominal subsidies paid into the pension accounts of eligible individuals (OECD 2018).

However, given that these measures imply a fiscal cost to governments, it is important that the intended objectives of the measures be met without causing an excessive fiscal burden on governments. There has thus been an increasing number of studies that assess the effectiveness of financial incentives introduced in various countries.[3] The empirical evidence from this literature seems somewhat mixed, but much of the evidence shows that the effectiveness of tax incentives as a tool for enhancing "new" saving is relatively limited as saving in pension accounts tends to crowd out saving in taxable accounts (e.g., Attanasio and DeLeire 2002, Chetty et al. 2014). Similarly, the incentive effects of employer matching contributions are found to be small (e.g., Mitchell, Utkus, and Yang 2007). These findings therefore suggest that the design of financial incentives needs to be improved to enhance retirement saving. Toward this end, we propose the following two policies:

Policy 4: Incorporate automatic enrollment and automatic escalation of contributions in pension plans.

Policy 5: Make offered financial incentives simple and stable.

In our view, the most effective way of encouraging individuals to save more for retirement is to increase their level of financial literacy, as discussed in Proposal 1, but a complementary approach is to get the design of the programs right. For example, Chetty et al. (2014) find that automatic employer contributions to retirement accounts are more effective at raising saving rates than tax subsidies, particularly among passive savers who are least prepared for retirement. Similarly, Benartzi and Thaler (2007) argue that automatic enrollment in company pension plans will lead to broader participation than requiring workers to fill out a form and bring it to a particular office to enroll. Another solution is the automatic escalation of contributions, and the "Save for Tomorrow" program, which pre-commits workers to save more every time they receive a pay raise, is a concrete example of this approach. Many retirement plan administrators in the United States (US) have adopted this program, and Benartzi and Thaler (2007) show that a large share of workers signed up for the program when it was offered to them and that it led to sharp increases in saving for retirement. Given that people tend to save too little for their retirement in the first place as a result of inertia, procrastination, and myopia, making the default setting of pension plans automatic enrollment is likely to be more effective than tax subsidies at raising saving for retirement. We also propose that financial incentives, whether tax or non-tax, need to be simple and stable to meet the intended objective of these measures. Programs that are complex with many options and/or with frequent changes are harder for people to comprehend, and they will be reluctant to sign up for them.

[3] See OECD (2018) for a comprehensive survey of the literature.

Proposal 3: Facilitate the decumulation of wealth after retirement

One of the puzzles about the saving behavior of the elderly identified in empirical studies is that they do not decumulate their wealth at all or that they do not decumulate their wealth as rapidly as predicted theoretically (e.g., Horioka 2010; De Nardi, French, and Jones 2016; Horioka and Niimi 2017; and Niimi and Horioka 2019). The three leading explanations for this phenomenon are that the elderly want to leave bequests to their children, that they are worried about future medical and long-term care expenses and/or about running out of wealth before they die, and that financial products that would facilitate wealth decumulation are not available. A consensus has not been reached about the relative importance of these explanations, but they are all undoubtedly important to at least some extent.

Here we wish to focus on what financial products can be used to make it easier for the elderly to decumulate their wealth in order to finance living expenses during retirement, and thus we propose the following four policies:

Policy 6: Introduce financial products that make it easier for the elderly to decumulate their wealth.

Policy 7: Ensure that such financial products are safe, properly designed, and actuarially fair.

Policy 8: Make information on such financial products more readily available.

Policy 9: Enhance the capacity of the relevant stakeholders to assist and guide the elderly with deteriorating cognitive skills to make appropriate financial decisions.

One financial innovation that will help is **private lifetime annuities**, which will enable the elderly to increase their spending on living expenses without having to worry about running out of wealth before they die. Another closely related financial innovation is **reverse mortgages** (also called **home equity conversion mortgages**), whereby the elderly sell their homes to another party subject to the provision that they be allowed to continue living in the house until they die. In effect, the elderly borrow from the party purchasing their homes using their homes as collateral. The advantage of this product is that it allows the elderly to draw down their housing wealth while continuing to live in their homes until death. Since many elderly have a strong preference for living in familiar surroundings until their death, this is an especially attractive financial product. A more general financial innovation is **home equity loans** whereby homeowners borrow using their homes as collateral. Such loans have shown rapid growth in the US, as documented by Canner, Durkin, and Luckett (1998).

Nevertheless, many of these financial products are currently available only in a few economies. For example, reverse mortgages are available only in such economies as Australia; Canada; Hong Kong, China; Japan; Taipei,China; and the US. Moreover, even where these products are available, their take-up rate is low. For example, in the US where such products are relatively more available, Benartzi, Previtero, and Thaler (2011) find that the take-up rate for annuities was only about 13% in their sample of enrollees in defined-benefit company pension plans. Similarly, Nakajima and Telyukova (2017) find that the take-up rate for reverse mortgages among eligible homeowners was only about 2% in 2013.

There is a large literature that examines possible reasons for the low take-up rate of private annuities—the so-called "annuity puzzle." Benartzi, Previtero, and Thaler (2011), for example, find that the low take-up rate for private annuities is due partly to the time and trouble needed to decide on an annuity supplier and an annuity plan. Among the few studies that look at the case of reverse mortgages, Nakajima and Telyukova (2017) find that the low take-up rate for reverse mortgages is due partly to high loan costs, especially the high mandatory insurance costs. These findings suggest that even in economies where these financial products are already available, there is room for making their terms more favorable and for making information on such products more readily available to enhance the take-up rate. It is equally important, however, that people have an

adequate level of financial literacy to fully understand and maximize the benefits of these somewhat complex financial products in order to enhance their financial well-being during retirement.

Lastly, a growing challenge of population aging in recent years is to ensure that the elderly make sound financial decisions throughout their lives even if they face growing difficulties with cognition as they get older. It is thus important to accommodate the needs of the elderly by enhancing the capacity of the relevant stakeholders (e.g., public pension officers, regulators, financial advisors, financial institutions) to assist and guide the elderly with deteriorating cognitive skills in their financial decision making.

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Aging Societies

Policies and Perspectives

Group of Twenty (G20) countries are being increasingly exposed to the effects of population aging, such as having an older and shrinking labor force with more retirees. In countries with aged or rapidly aging populations, these trends threaten the sustainability of fiscal institutions, including conventional tax design and pay-as-you-go pensions, and the efficacy of conventional macroeconomic policies and, thus, require timely structural reforms.

Meanwhile, in countries with younger populations, population aging compounds the disruptions linked to technological diffusion, rising inequality, high economic informality, and rapid regional migration and makes forward-looking policy development difficult. These countries must then actively pursue measures to establish a financing base for improved social protection and enhance macroeconomic integrity.

This publication recommends policy responses in three main areas. First, it proposes structural reform policies to promote economic growth, macroeconomic integrity, and a resilient labor market. Second, it suggests the reorientation of social protection systems toward poverty alleviation, wealth accumulation, adequate social security for all, and fiscal sustainability. Finally, it recommends the development of data systems, policy pools, and analysis pertaining to the demographic impacts in the G20 countries as well as the emerging economies outside the G20.

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