



**Determination of Retirement
and Eligibility Ages:
Actuarial, Social and Economic
Impacts**

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**This Paper has been produced by the Population Issues Working Group of
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Executive Summary

Increases in longevity and decreases in fertility have led to the aging of many countries' populations and to increases in old-age dependency ratios, the number of those over age 65 to the number of workers (usually expressed as those between ages 15 and 65). At the same time, current interest rates in many countries are at very low levels. These developments have increased concerns about the economic sustainability of current social security programs, resulting in pressure to modify their structure through reduced benefits and / or increased contributions, and in particular through an increase in their eligibility age (the age when an individual is eligible according to program rules to begin receiving full retirement benefits) that is the subject of this report. Simultaneously, these trends have increased pressure to contain the cost and manage uncertainty associated with defined benefit employer-sponsored pension plans, and created concerns regarding the ability of defined contribution plans to provide adequate retirement income.

Among alternatives considered in response to concerns about sustainability or affordability, many countries have increased or are considering increasing their eligibility age rather than reducing benefits or increasing contributions, both of which are usually deemed undesirable. This has usually been accompanied by an increase in the average age of retirement (i.e., when an individual chooses to leave the labour force).

Social security programs

There are considerable differences in social security eligibility ages around the world, including differentials by gender. The general trend in developed countries is towards an increase in the eligibility age, as well as convergence of eligibility ages for males and females. Moreover, various approaches to encourage (or discourage) early or late retirement have been adopted. Considerations when choosing one of these approaches include concerns relating to sustainability, affordability, cultural differences, adequacy, equity between groups, political circumstances and economic policy. Since there are no free options, it is inevitable that trade-offs may be needed; for example, an increase in benefit adequacy may jeopardize sustainability or affordability.

Changes should not create unintended behavioral consequences. Thus, coordination with other social security and social welfare programs, as well with the regulations and design of employer-sponsored pension plans, should be comprehensively examined when increasing the eligibility age in a social security program.

Employer-sponsored plans

Eligibility ages for employer-sponsored plans tend to cluster around the social security eligibility age. In addition to the considerations relating to social security programs mentioned above, the eligibility age, as well as early / late retirement provisions in an employer-sponsored plans, are affected by business objectives: in some situations, employers desire to retire older workers, and in others, the contribution of experience and maturity are viewed as an important factor for business success. The use of an eligibility age, together with phased retirement and part-time employment, can help ensure an orderly replacement of older employees by younger ones, provide continuity, enhance attitudes of employees and increase the diversity of technological skills of the employer's workforce.

Other elements related to an employer-sponsored plan (e.g., early retirement, late retirement, survivor and disability) can be modified to integrate with a new eligibility age. For defined contribution (DC) plans, an increase in the eligibility age can allow for higher benefits in part due to a longer accumulation period along with a reduction in number of payments in the decumulation period. To achieve actuarial neutrality (equivalent in expected cost terms) for both defined benefit (DB) and DC plans, an increase in the eligibility age needs to be less than the increase in expected longevity.

The individual

The individual's choice of when to retire partly depends upon the eligibility ages of social security and an individual's pension plan, as well as such factors as availability of other desirable employment, health condition, available financial assets and family situation. Another factor affecting retirement behaviour is the increasing tendency for life stages (education, work and retirement) to overlap or to come and go, rather than being clearly separate. Enumerating all the considerations that should contribute to an individual's decisions regarding when to retire is outside the scope of this report, but policy makers need to be aware that policy changes that do not fully consider the effect on human behaviour can lead to unintended consequences.

Considerations regarding increasing the eligibility age

Where sustainability of a social security program or employer-sponsored defined benefit plan is a significant concern and is primarily due to an increase in longevity, an increase in the eligibility age is likely to be the fairest response.

In comparing two individuals with the same physical history and condition, the younger person will usually expect to live longer than the older one from an earlier generation, thus collecting more total benefits for the same number of years of contribution. Raising the eligibility age can offset the effect of increased longevity by keeping the percentage of time in retirement more consistent by generation, since it would both extend the contribution period (thereby increasing the productive capacity of the economy) and reduce the benefit period. Without action of this type, both the sustainability of the program, and the fairness and equity between generations can deteriorate over time. Put differently, not increasing the eligibility age as life expectancy increases (and keeping contributions and benefits unchanged) would imply, contrary to any reasonable intergenerational measure, a belief that these increases do not affect the fairness of the program.

An additional consideration in deciding whether to increase the eligibility age is that it encourages retaining the skill sets of more experienced workers and may transfer them more efficiently to the next generation, with possible resultant higher productivity and less disruption to the labour force. Thus, increasing the number of older workers can benefit the economy, and there is no evidence that increasing the eligibility age may increase youth unemployment. Further, many older workers find satisfaction and health benefits in continuing to work where they are able to do so.

Making a change in the eligibility age can be difficult, especially if a long lead time for the change is not provided, because many people's long-term financial plan assumes the current eligibility age will remain constant. The linkage of eligibility age and longevity expectations can reduce, but not eliminate, uncertainties. Nevertheless, deferring changes can lead to financial and intergenerational unsustainability and uncertainty, to the detriment of all involved parties. It is important to regularly provide effective communication of such a change to those affected to reduce this uncertainty and to facilitate future planning.

Also, because the circumstances of individuals are so varied, choice should be provided through reduced benefits for retirement prior to the eligibility age and increased benefits for later retirements.

Concerns with increasing the eligibility age

In evaluating whether to increase the eligibility age, several concerns may need to be addressed. It is important to determine the effect of such a change on various population sub-groups to determine the extent to which actuarial fairness (neutrality) should be maintained. Changes in contributions and benefits should be considered as alternatives or supplementary actions. Other factors for consideration may include the effective use of disability and social welfare benefits, if applicable, as well as appropriate treatment of specific population subgroups.

Overall, longevity (and particularly healthy longevity) is greater for people in higher socio-economic groups. Thus, increasing eligibility age in line with increases in life expectancy will have a larger relative impact on those in lower socio-economic groups who need social security benefits most. As such, increasing the eligibility age for social security programs (especially ones that provide universal minimum benefits) could be viewed as a regressive measure. Effective early retirement or income support programs and increased acceptance of phased retirement may be needed.

The effects of potential changes to a social security program should be assessed to ensure that there are no unintended adverse consequences for particular groups (e.g., reducing individual saving or promoting a disincentive to continue working). Similarly, inter-population and inter-generational consequences should be explicitly considered to ensure that relative fairness is examined for a wide range of individual circumstances. Features that can affect fairness include a minimum floor of protection, relationship of benefits to contributions paid and inter-population equity and inter-generational transfer payments. Social security systems are based on considerations of both adequacy (that may involve a redistribution of wealth) and actuarial fairness (that incorporates a relationship between contributions and expected benefits).

Examples of alternative or supplementary approaches that could be considered include: increasing early retirement penalties and rewarding delayed retirement, strengthening eligibility requirements for retirement benefits, adopting eligibility ages that differ by population subgroup, encouraging or incentivizing workers to remain longer in the labour force whether on a full-time or part-time basis, encouraging higher individual and corporate-sponsored pension savings, subsidising certain population subgroups with special needs where appropriate, linking the eligibility for pension benefits to the eligibility age for other benefits, harmonising the eligibility age of employer-sponsored pension plans with social security programs and providing appropriate benefits for the period between retirement and the eligibility age.

Effective communication is important to provide confidence in a retirement incomes system and to explain the need for change in the system.

Role of the actuary

Actuaries are well placed to assist policymakers and employers assess the effects of an alteration to the eligibility age or the effect of other responses to changing conditions. Actuaries can model the complex interactions of the economic and demographic factors with a program's benefit provisions to assess the overall cost and how it is distributed between population sub-groups and different generations. The role

of the actuary extends to effectively communicating the availability of alternatives, the results of the calculations and to identifying the main drivers of the expected outcomes.

Conclusion

Increase in the eligibility age in respect of all retirement income pillars should be examined as a part of any strategic reform that aims at creating a balanced and efficient old age policy that adequately responds to the challenge as well as minimizes the collateral damage for more vulnerable segments of population.

Introduction

Historically in many countries, the concept of retirement didn't arise prior to the late nineteenth or early twentieth centuries. Once this idea took hold, transitions between different life stages (e.g., education, work and retirement) became clearly defined. As soon as a person retired, he or she stopped working and depended on their personal savings, moved in with their children and received retirement benefits, if any. Over the last several decades, as illustrated in Chart 1, the clear divisions between life stages have become blurred. The length of these stages may change or they may overlap with subsequent stages, depending on the social and economic conditions of the society under consideration, or even between groups within the society. Particularly affected is the concept of (a fixed and well defined) retirement age.

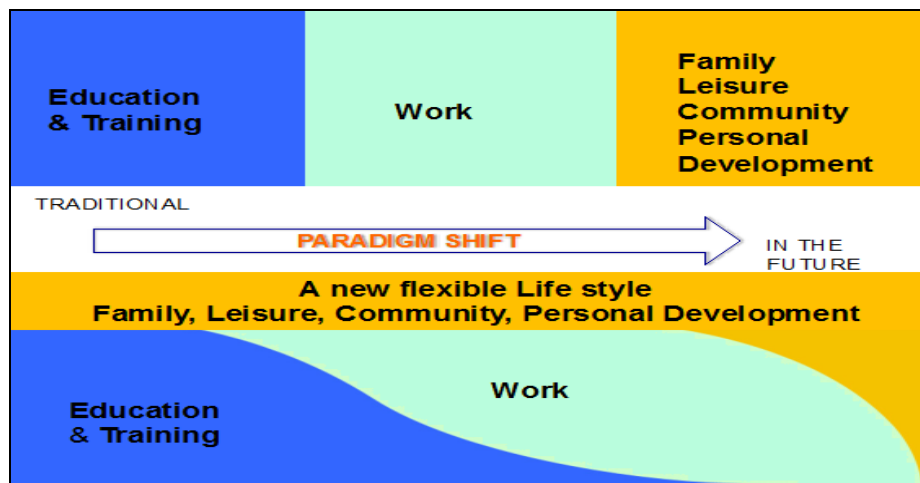


Chart 1 Life stages paradigm shift

The age mandated by the applicable country's laws, social security programs, certain pension plans, or for population subgroups subject to employment contracts or in specified professions (such as firemen or airline pilots), is often referred to as the "eligibility age". Usually, the eligibility age is the age when the person may, or is required to, retire from his or her workplace, or when the person becomes eligible for a "regular" old-age pension¹. Often, though, this is also the age when people move from full-time work to a part-time role.

The concept of "retirement age" is rather vague and open to various interpretations. Its normal use is the age at which full-time work comes to an end. In contrast, the retirement age of an individual depends on many personal, economic, health, and communal factors, and cannot be used as a basis for a societal retirement age strategy. With this in mind, and to be consistent with the common use of the terms, retirement age is used here to refer to the actual time at which retirement begins and eligibility age refers to the age at which an individual is eligible to begin receiving full (i.e., unreduced) benefits.

Developments over the last several decades have led to a shift in the life stages paradigm. These developments include:

¹ This can also be referred to as a "state pension age", "work retirement age", "normal retirement age" or "plan retirement age".

- The transition from agricultural to industrial production to a primarily services- and information-based economy;
- Lengthening of life expectancy and changes in the patterns of mortality and morbidity;
- Changes in the population pyramid² due to fertility reduction, resulting in fewer children and working adults relative to older people, and increased reliance on work by older workers;
- Increased participation of females in the labour force;
- Increased financial burden on pension programs due to a longer retirement period, concurrent with decreasing investment yields, leading to the inability to save sufficient retirement funds during the working period;
- Accumulation of huge assets in pension plans and state programs that may outstrip the ability of the market to effectively absorb these invested monies and ensure an adequate return;
- Increasing income inequality, which can have the effect of reducing the ability of many people to save for retirement; and
- Increased use of phased retirement (in contrast to earlier years before the retirement concept was introduced, males in particular worked until they were no longer able to), whereby workers can gradually reduce the percentage of time devoted to work with age, i.e., through part-time work or phased retirement.

Often, within a nation or society there are multiple eligibility ages. Some are dictated by law for the entire population (e.g., social security eligibility age), some are directed at specific types of workers (e.g., teachers, firemen and public workers) and some are determined by employment contracts or labour agreements between workers and employers. The demographic, cultural and economic characteristics of certain populations have led to different eligibility ages (e.g., the eligibility age for professionals tends to be higher than that for agricultural or mine workers, while males and females may have different eligibility ages, although the latter is currently less common than in the past). Some eligibility ages are mandatory (e.g., for pilots of commercial airplanes), while others are more indicative and provide flexibility in the actual retirement age. This flexibility may take the form of early or late retirement ages (in comparison to the eligibility age) with, sometimes, no maximum age limit, often with reduced or increased benefits, respectively.

Legislation often sets a single eligibility age for multiple and diverse populations. This may be perceived as unfair for some. For example, certain groups, such as those who are handicapped, are limited in their ability to work and to save, while others, such as miners or agricultural workers, may have their ability to work curtailed because of the nature of the work as they advance in age. As this suggests, it is important to rethink how society makes effective use of the labour force by enabling individuals to contribute to their potential by providing a better social contract that does not deprive them of their dignity, while at the same time considering societal objectives including fairness and availability of other social benefits.

This report covers the principles and considerations affecting the stakeholders involved, including the individual, the family, the employer and the State. Clearly, the characteristics of a specific population should be considered before an eligibility age for that population can be established or subsequently changed. The required modeling and considerations are compounded when multiple populations are considered concurrently, as in the determination of an eligibility age for a nation.

² See graphical development of population pyramids and related statistics over many years for many countries in <http://www.worldlifeexpectancy.com/world-population-pyramid> and in <http://www.worldlifeexpectancy.com/>

There is no single “cookie cutter solution” for the complex balancing of assuring sustainability and affordability of any pension program against the fairness of benefits and contributions among plan sponsors, individuals, population subgroups and generations. Although there always will be winners and losers, it is important to assess whether the benefits of increasing the eligibility age outweigh the disadvantages for various subgroups and whether, how and to what extent those whose position is relatively disadvantaged may be compensated or alternatives sought that might offset some of these adverse consequences.

There are also additional issues to consider related to the entire economy. For example, will pursuing sustainability compromise adequacy to an unacceptable level and lead to an increase in poverty, as well as to changes in labour markets and unemployment of different age groups, which may in turn result in a decrease in consumption and slower economic growth? Attention to overall economic sustainability is also important, as goods and services, as well as jobs, are necessary to make the entire system work. If possible, it is important to attempt to anticipate unexpected retirement behavior. And of course, it is always necessary to consider that if a social security program and the total economic system collapses because one or both are unsustainable, the social security program will also fail to provide security.

The eligibility age for a population subgroup is a significant public policy issue. It involves the quality of life of the population, health care and long-term care systems, social welfare policy and economic competitiveness in light of global markets, to mention just a few. It is affected by political, social and economic goals (such as “nudging” people to a particular behavior). Although these considerations are beyond the scope of this report, they are also important. Public policy decisions must aim at an optimal resolution of these often conflicting considerations and constraints.

In this report we present and analyze the feasibility of various strategies to determine eligibility ages for the population at large or for specific sub-groups with common characteristics. In Chapter 1 the eligibility age is discussed from the perspective of a social security retirement program and of an employer-sponsored pension plan, as well as from the retiring individual’s perspective. The role of the actuary is also addressed. Chapter 2 discusses the demographic factors that promote an increase in the eligibility age. In Chapter 3 the changes of the eligibility age of a social security program are analyzed through the prisms of affordability, sustainability, and social and individual fairness of the program. Chapter 4 discusses possible strategies to change the eligibility age. Finally, in Chapter 5 the positive and adverse effects of different eligibility ages on employer-sponsored plans and social security pension programs are discussed.

Chapter 1: Perspectives on retirement

1.1. Introduction

In this chapter we discuss how eligibility for old-age retirement benefits is handled by several major stakeholders. Specifically, we address nation-wide social security programs, employer-sponsored plans (often referred to simply as pension plans, normally sponsored by one or more employers or a union) and considerations of individuals who compete for employment. The chapter closes with a brief discussion of the role of actuaries in dealing with the issues involved.

Retirement patterns differ by country and change over time, affected by the evolution in cultural, social, political, demographic and economic environments, as does the public policy of a country. Usually, the eligibility age defined by public policy becomes the focal point around which other retirement programs cluster their eligibility ages.

Retirement patterns are affected by the social safety network of the nation, including social security, employment legislation, social welfare and health care systems. They are also affected by changes in the labour market, including unemployment, labour force availability, outsourcing patterns and the readiness of employers to employ older workers.

Consequently, retirement, usually the time when a person substantially leaves the workforce, doesn't necessarily coincide with the eligibility age or the time when pension benefits commence. Moreover, the date of retirement also depends on an individual's present and expected future personal and family wellbeing and other circumstances.

Today's financial challenges are felt by individuals, their families, employers and governments, often caused by inadequate savings and protection against adverse life cycle events. As the ratio of workers to retirees decreases due to increased longevity, low fertility and in some cases later entry into the labour force, and demands for other government services increase, long-term affordability and budgetary challenges that retirement benefit programs commonly face can become quite large and threaten the programs' sustainability.

Although the active labour force often pays for current benefits payable under social security programs, current workers expect in return to receive their own benefits at a later date. However, because of the challenges associated with maintaining sustainability, these expectations may become unrealized and without program changes many countries' retirees in the future may not receive adequate social benefits. As a result, private savings, employer-sponsored pension plans, and continued work will be needed to provide many people a minimum level of income.

Although much of the discussion in this report relates to features of specific private and public programs, policy decisions regarding program features should consider the effect on and the effect of all relevant programs.

1.2. Social security programs – incentives to retire early or to delay retirement

The eligibility age for a social security program is defined in this report as the age when an individual has access to a **full** retirement benefit from the program, i.e., without adjustments for early or late retirement. In practice, in addition to the possibility of providing different eligibility ages for males and

females, these programs often allow early and / or delayed retirement and may contain features that induce participants to retire earlier or later. To complicate matters further, where a country has multiple social security programs the eligibility age can differ between these programs. Although the very existence of an eligibility age can influence the timing of retirement, several other design features of a program and individual circumstances can as well.

The variability in the eligibility age pattern in the world is demonstrated by Charts 1.1A and 1.1B, which present the distribution of countries by statutory retirement (eligibility) age and by region for females and males, respectively.

Distribution of countries by statutory retirement age for women: major areas, 2013

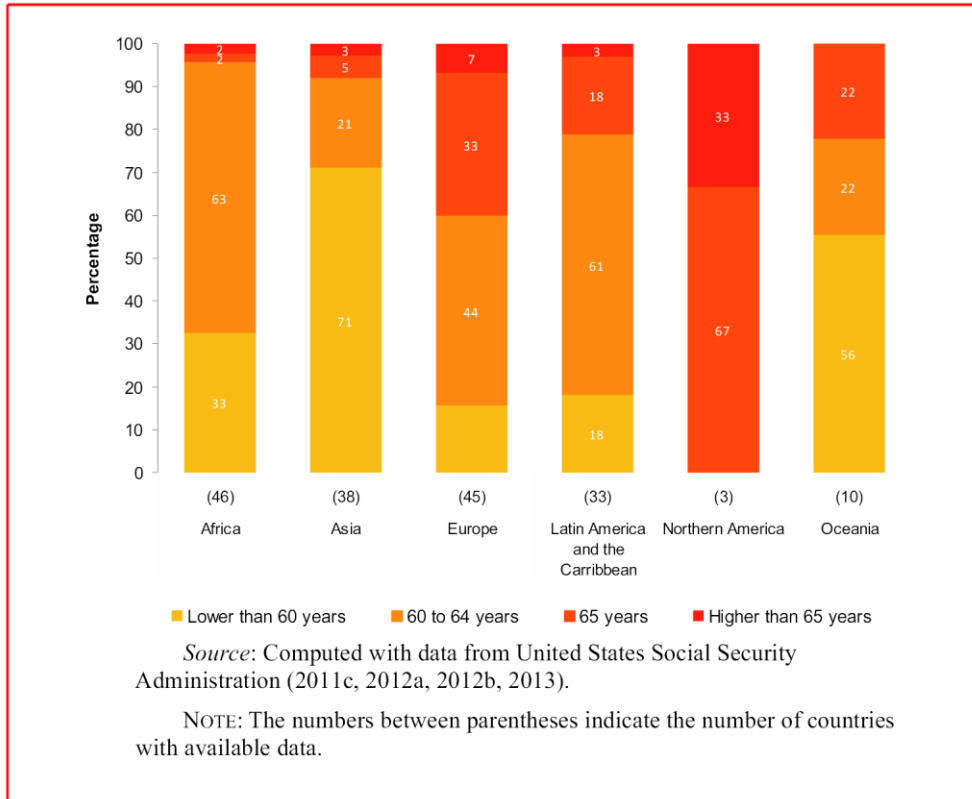


Chart 1.1A Distribution of countries by retirement age – females

source: United Nations (2013), figure 4.12

Distribution of countries by statutory retirement age for men: major areas, 2013

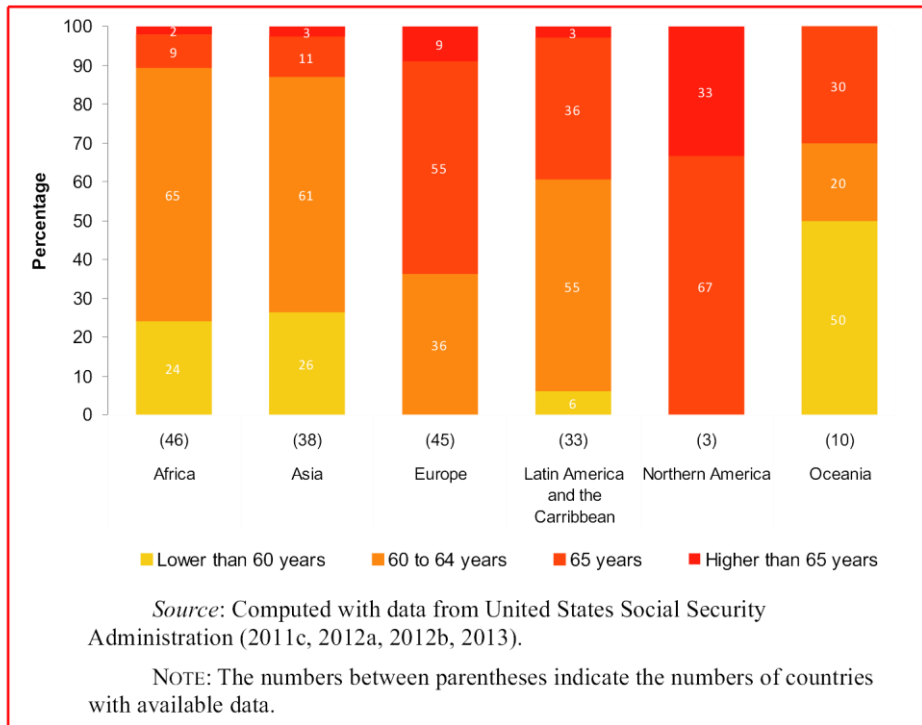


Chart 1.1B Distribution of countries by retirement age – males

source: United Nations (2013), figure 4.11

The general trend in developed countries is towards an increase in the eligibility age, as well as convergence of eligibility age requirements for males and females. However, the eligibility age of many countries remains at a lower level for females than for males. The gap between male and female eligibility ages has been affected by historical and cultural considerations, including lower income levels and different working patterns of many females, as discussed in Chapters 4 and 5 of this report. Other arguments for a difference were that females were often married to an older male and earlier retirement was thought by some to be appropriate for females to reflect their role in bringing up their children and a more intensive involvement in caring for parents.

When social security programs allow flexibility regarding when their retirement benefits can begin, that is, before or after the eligibility age, actuarial adjustments are usually used to reduce or increase benefits, respectively. These adjustments are often labelled as “actuarially neutral” when, other things being equal, the present value of benefits are roughly equivalent across age at inception. However, deviations from actuarial neutrality can be applied to these adjustments to implicitly influence participants’ retirement behaviour.

But what does actuarial neutrality mean in the context of a social security program? It does not mean equivalence from an individual’s point of view. Rather, it reflects the aggregate effect of population averages as a result of risk pooling, over many population subgroups, and sometimes generations. No defined benefit (DB) plan, or even defined contribution (DC) plan³ that annuitizes individual accounts,

³ In DC plans, the accumulated personal savings fund at the time of retirement may be converted to an annuity using actuarial factors applied to an individual (similar to life annuity programs). However, in most countries these conversion factors do not take into account (in contrast to life insurance) individual risk factors (e.g., health status) and are based on population life tables and the plan’s discount rate. An example of an instance where individual risk factors are taken into account is the U.K. where individually underwritten annuities are commonly available.

be it public or private, can practically pay early or delayed benefits that are neutral from an individual's point of view, i.e., tailored to the demographic and health characteristics of an individual and reflecting discount rates based on each individual's preferences. This would require having as many adjustment factors as there are beneficiaries, necessarily based on subjective assessment.

In summary, actuarial neutrality means equivalence with respect to a social security retirement plan as a whole. Actuarially neutral adjustments are economically equivalent when considering a group of individuals, with adjustments that may differ by cohort. Nevertheless, even within a given cohort, there may be a loss of actuarial neutrality between subgroups differentiated by such characteristics as gender, income, health condition and type of employment because of their different expected longevity.

The determination of these actuarial adjustments for partially funded or pay-as-you-go social security programs can be based on a variety of methods and factors, independent of type of funding. These methods sometimes are linked to the approach used to determine the program's parameters such as contribution rate. The steady-state method, used for the Canada Pension Plan (CPP), is one such example. Under this method, actuarial neutrality is considered to occur when the net cost to the plan (at the steady-state contribution rate) is the same whether the individual begins taking her or his benefits at age 65 or any other age from 60 to 70. Calculations include several cohorts of contributors and beneficiaries; inter-generational actuarial neutrality is a primary consideration (Canada Pension Plan (2003)).

Poorly designed early retirement options for social security may prove more expensive than expected due to a higher than expected utilization rate of the early retirement option. Overly generous benefits and lax eligibility requirements, as well as requirements to exit the labour force (to avoid receiving multiple sources of retirement income, sometimes referred to as "double dipping"), are some of the features of early retirement provisions that may contribute to a distortion of the labour market. A notable example of an early retirement program that did not work as intended was the Danish voluntary early retirement program (VERP). Between its introduction in 1979 and 2004, the year when further reform of the program began, the share of the Danish working population retiring early increased from about 1% to over 5%. After a series of reforms making these early benefits less generous and less accessible, this share decreased to about 3.5% by 2010 (OECD (2012)).

Early retirement programs can present a problem not only in countries with an ageing population, but also in countries with a young population such as Saudi Arabia and Iran. In Saudi Arabia the unreduced early retirement pension could be taken at any age after 25 years of contributions; while only 11% of retirees took early retirement in 2002, it has grown to 30% by 2011. As a result, early retirement provisions are identified as a major threat to the financial and inter-generational sustainability of the Saudi Arabian pension plan (Menard et al. (2013)).

Another example is Iran, which attempted to address its high youth unemployment by encouraging early retirement. However, it has not succeeded in its objective, as it merely resulted in many early retirees moving to another job while simultaneously receiving a pension from their earlier job. Thus, not only was the reduction in unemployment not fully achieved, but the sustainability of Iran's social security program and pension plans has deteriorated as a result. This illustrates that policy changes that do not fully consider the effect of human behavior can lead to unintended consequences.

A pension program provides incentives to retire earlier if additional years of work result in a reduction of pension wealth (i.e., present value of the lifetime flow of pension benefits). This reduction might arise as, for example, a result of generous early retirement subsidies, limits on the benefit accrual period, failure to maintain the value of lifetime earnings, and interaction of pensions with income-

tested social security or social welfare benefits. Further discussion and modelling results can be found in OECD (2011).

A social security program that offers early retirement benefits doesn't necessarily have an adverse effect on the program's sustainability. An example of early retirement provisions without adverse effect can be found in the earnings-related components of the Canadian social security system, the Canada and Quebec Pension Plans (C/QPP). Both plans allow for benefit uptake for up to five years before and after the eligibility age of 65. At the same time, if a person continues to work after applying for an early benefit (i.e., becomes a working beneficiary), both that person and her / his employer are required to continue contributing to the C/QPP. In exchange, a working beneficiary accrues additional retirement benefits.

Similar features exist in the Israeli and U.S. social security programs. In the latter, benefits are reduced by about 8% for each year benefits begin before the eligibility age, which is a higher rate of reduction than if benefit reductions were actuarially neutral. In Canada and the United States benefits are structured in such a way that if there are no changes in earnings level it is more advantageous for an individual of average health to apply for benefits at a later date than to become a working beneficiary.

1.3. Employer-sponsored pension plans

Although eligibility ages in employer-sponsored pension plans may not be the same as the eligibility age for a country's social security benefits, they tend to cluster around it.

Similar to social security programs, some employer-sponsored pension plans offer an early retirement feature, which can either be subsidized, penalized or actuarially neutral. The availability of delayed retirement is not as widespread, as employers may be interested at some point in replacing their older workers, who are usually higher paid.

Employer-sponsored pension plans are often used by employers as a human resource management tool (e.g., for recruitment, retention and replacement of labour force objectives). For private sector companies, it may be of benefit to induce its labour force to retire "on time", that is neither too early nor too late for business purposes, partly to reduce costs or to provide more opportunities for younger employees. Companies restructure to improve competitiveness and cut costs, and often will pay for several years of early retirement benefits beyond what is offered by their normal pension plan provisions. The reverse situation can also occur – especially when older employees possess unique skills and knowledge that are indispensable for a company.

So, setting the eligibility age in employer-sponsored pension plan design, whether of a DB or DC structure, usually considers the following questions:

- What is the "customary" eligibility age in its industry (to assist human resource competitiveness and employee acceptance)?
- What is the cost of early or delayed retirement patterns for the organization?
- What is the value of older employees to the business?
- What is the value of experience and long service to the business?
- Is the value of job security to employees properly aligned with its value to the business?
- Will benefits be adequate (likely to arise in a unionized environment)?

Key considerations from an employer point of view in employer-sponsored pension plan decision-making regarding eligibility age include its implications for sustainability and affordability of the plan. Thus, each business defines eligibility age (as well as early and/or delayed ages) considering its own business situation and objectives, subject to any legal, regulatory or contractual constraints, which may prove to be inconsistent with its employees' preferences. In a unionized environment, employees' preferences may be given greater prominence as a result of negotiation processes. The same principle applies to any actuarial adjustment factors used. They are generally designed to be neutral to a plan, not to an individual. These considerations mostly apply to DB plans, as the investment and longevity risks are transferred to the individual employees in DC plans.

As a result, a large subgroup of the private sector attaches less value to older workers, especially in physically or technologically demanding industries. Thus, while trends in social security programs often encourage beneficiaries to apply for benefits at a later date for sustainability reasons, companies may structure their pension plans to encourage employees to retire earlier (with either unreduced or at least larger benefits than if determined on an actuarially neutral basis).

Since employer-sponsored pension plans are often provided a special tax status, tax regulations are a tool that can be used by a country to influence employer-sponsored pension plans' eligibility age, as well as early / delayed retirement provisions. For example, while workplace pensions in the Netherlands have a different eligibility age than the eligibility age of the Dutch social security program (Algemene Ouderdoms Wet or AOW), to receive favourable tax treatment for contributions these plans are currently required to have an eligibility age of 67 years. This eligibility age is linked to the eligibility age of the AOW, which is expected to increase in the future.

Beginning in the early 1980s, voluntary early retirement plans ('VUT') in many sectors in the Netherlands were set up on a pay-as-you-go basis. This development came as a result of collective efforts among stakeholders (i.e., the state, employers and employees) to reduce youth unemployment.

As a result and partly because of the generosity of the overall pension system, the rate of early retirement significantly increased. Because of the consequential increase in costs for employers and the ageing population, reform of the VUTs began a few years ago. In addition, some pension plans established pre-funded early retirement programs as the new norm. To encourage higher labour force participation by older workers, the favourable tax treatment of these programs was eliminated in 2006. In 2011, conditions for early retirement were scaled back further, as employee VUT contributions were no longer tax deductible and employer contributions became taxed at 52% (in contrast with the previous rate of 26%).

The Netherlands' example suggests that harmonisation of the eligibility age for social security programs and the eligibility age for employer-sponsored pension plans can be achieved if all the stakeholders participate in negotiations, which also results in sending a uniform message to individuals concerning the desired timing of their labour force exit and need for corresponding private savings. In any case, potential behavioral and cost consequences also need to be considered.

1.4. When do people retire today and why

Along with the availability of social security benefits and retirement income from employer-sponsored pension plans, if any, many considerations impact an individual's decision to retire from the labour force. These should also be taken into account by policymakers and employers, as they may affect the readiness of the public and plan participants to accept any proposed strategies.

Some of these considerations include:

- Availability of employment;
- Health status of participants and their dependents;
- Expected future lifetime;
- Retirement status of spouse / partner;
- Cultural practice and peer actions;
- Economic conditions (i.e., affordability of being retired);
- Availability of retirement savings; and
- Availability of family and other caregivers during the retirement period.

The timing of actual retirement often does not align with either formally defined eligibility ages or individuals' earlier expectations. Chart 1.2 shows Americans' actual vs. expected retirement age during 2002-2014, as identified by a Gallup (2015) survey. The increase in both expected retirement age (i.e., expectations of when retirement will occur) of workers and actual retirement age of retirees is evident. It can also be seen that the actual retirement age during this period was 4 to 7 years younger than that expected while working, although some of the changes subsequent to 2009 were due to the global financial crisis. Chart 1.3 compares the average effective age of labour exit with the social security eligibility age in OECD countries. As can be seen, there can be a wide discrepancy in experience and expectations between countries.

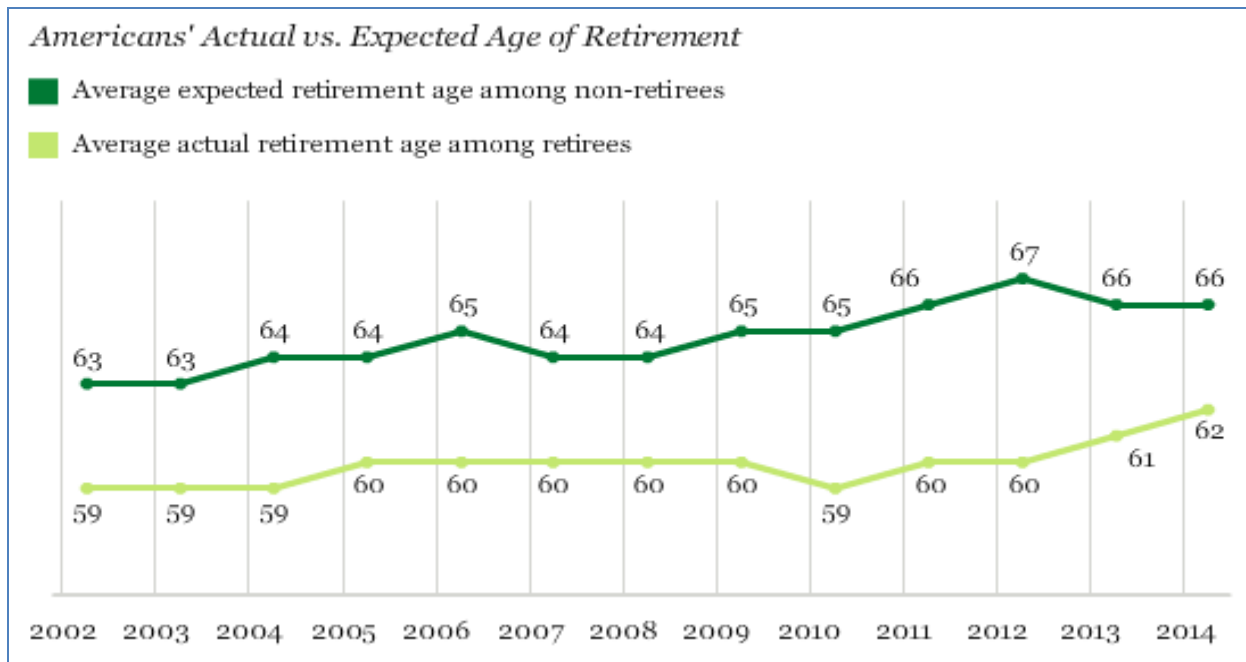
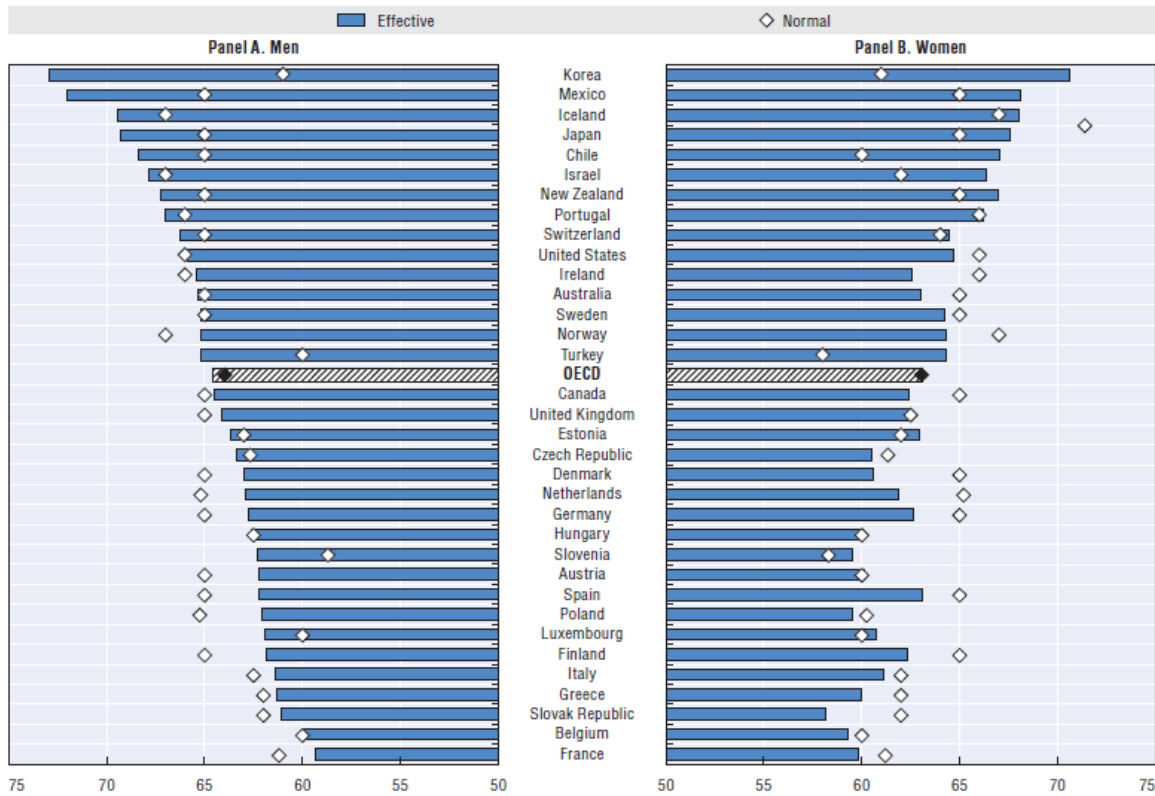


Chart 1.2 Americans' Actual vs. Expected Age of Retirement

Source: Gallup (2015)



Note: Effective retirement age shown is for five year period 2009-14. Pensionable age is shown for individuals retiring in 2014 and assuming labour market entry at age 20.
 Source: OECD estimates based on the results of national labour force surveys and the European Union Labour Force Survey (EU-LFS).
 StatLink <http://dx.doi.org/10.1787/888933300814>

Chart 1.3 Average effective age of labour market exit and social security eligibility age 2014
 Source: OECD (2015)

The contributing drivers of the relatively recent trend toward delayed retirement have included an increase in the age of eligibility for social security benefits, an increase in financial uncertainty, a decrease in investment prospects, and a change in the demographic characteristics of the population. Because people are living longer, pension savings that seemed sufficient for a decent income during retirement are now perceived to be less sufficient. At the same time more people are healthier for longer than ever before⁴, enabling them to continue working for a longer period, especially in less physically demanding jobs.

As a result, labour force participation rates of those older than age 60 have been increasing in many countries this century. High participation rates of the late 19th and early 20th century when there was no social security or employer-sponsored pension programs, reflect many people’s need to work, as shown in Chart 1.4 for U.S. experience. As pensions became available, labour force participation rates decreased. Similarly, when much of work by females was limited to homecare outside of the formal labour market, their labour participation rate was low. Although these rates increased as more females entered the job market, even today the labour force participation rate of females after age 65 remains low in the majority of the OECD countries, including the United States. Chart 1.4 shows that from the mid-1980s, labour force participation rates for older individuals has been steadily increasing, especially for females, while the rate for males, at least in the United States, has increased in the 2000s.

⁴ Based on the World Health Organization data, the healthy life expectancy at birth in Europe has increased by almost 3 years for males and 2.5 years for females between 2000 and 2013.

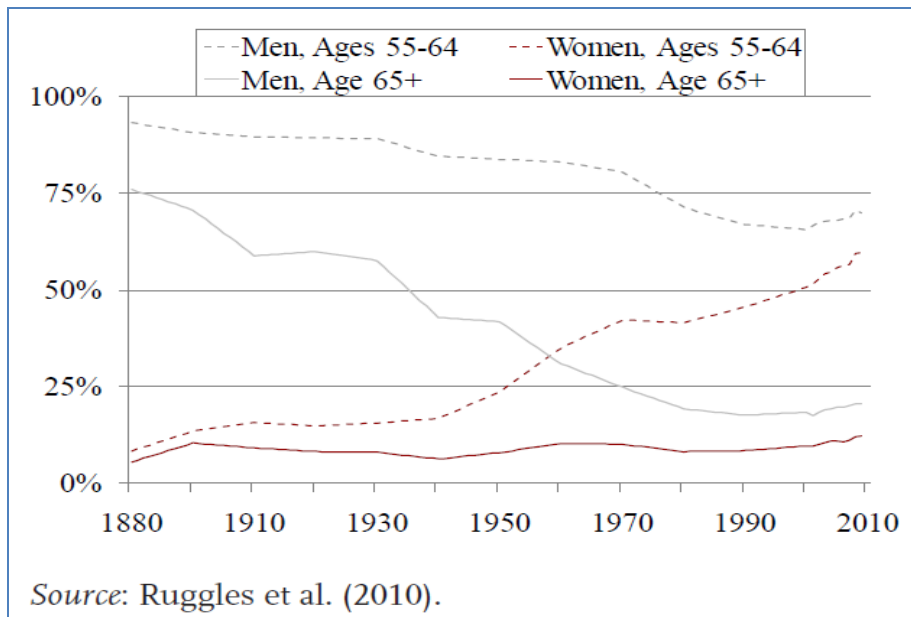


Chart 1.4 Labour force participation rate for older age groups, United States
 source: Munnell (2011)

Chart 1.5 shows that labour force participation rates for those older than 65 have and are expected in the near future to differ considerably between more developed and less developed regions of the world. First, labour force participation rates in less developed regions are significantly higher than those in more developed regions. Second, while these rates have been increasing, albeit slightly, in more developed regions, they are declining somewhat in developing countries. All countries need to carefully assess their trends in developing retirement policy decisions in light of their individual situation, including the effects on labour force participation in all age groups.

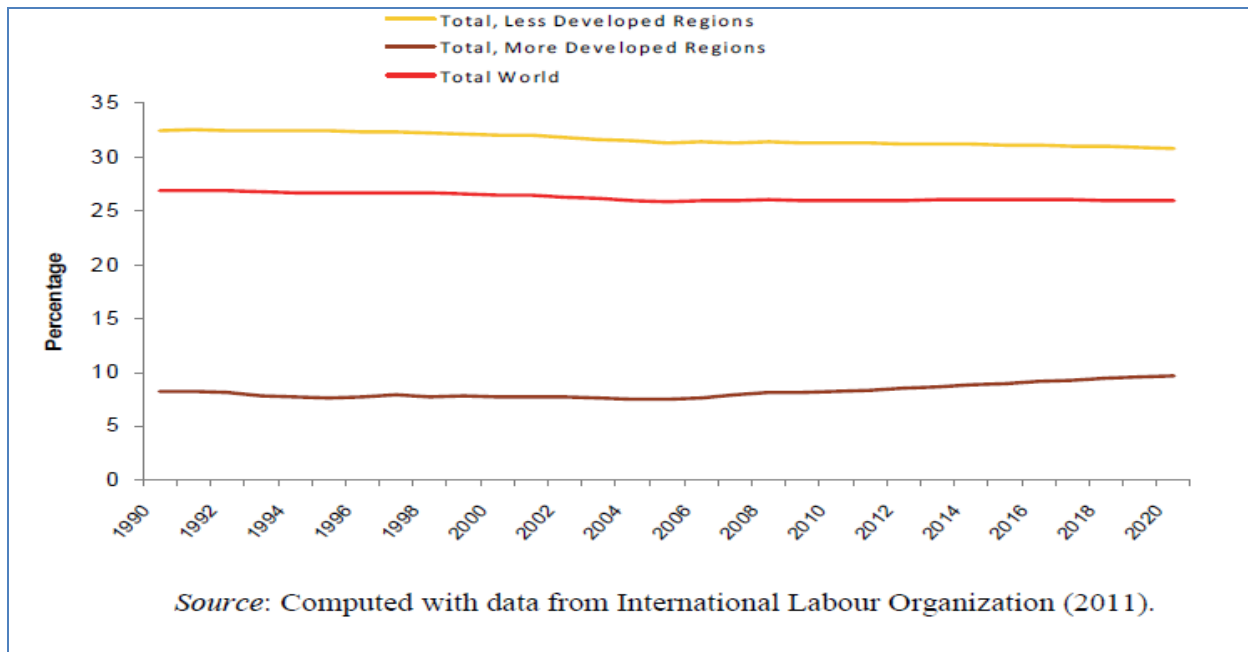


Chart 1.5 Labour force participation rates over the world for individuals aged 65+
 source: United Nations (2013), figure 4.7

The transition to retirement no longer always happens overnight – many people in the 65-69 age group both work and receive benefits from social security and employer-sponsored pension plans. Naturally, as people age, the percentage working declines, but an impressive 11% of Canadian seniors in the 70-74 age group continued to work in 2009 while receiving pension income (CIA (2013)).

As mentioned above, one reason why seniors delay retirement is that living without a job is unaffordable. Those not receiving social security and / or some form of employer-sponsored pension benefits may have to depend almost entirely on their personal savings, which in many cases may not prove adequate to provide their hoped-for standard of living. In some cases, even the total income from these three sources may prove insufficient, especially over a longer than anticipated lifetime in retirement or in cases of increasing medical needs. Macro-level economic shocks, such as those experienced in 2008-2009 in many countries, can also have a dramatic impact on the adequacy of retirement income. As estimated by the ILO (2009), the investment losses of 2008 in some countries were equivalent to a loss of about four years of savings for funded pension plans; many people cannot afford such savings shocks.

Other factors that can adversely affect the adequacy of retirement income include prolonged periods of low investment yields and uncertainty regarding future longevity and healthy longevity improvements. These factors are also reflected in the assumptions used to determine the amount of benefits provided by pension annuities, which can result in a dramatic increase in their cost or a decrease in benefit levels. Those close to retirement are faced with a choice of whether to take a guaranteed lower retirement income in the form of an annuity or face the risk of outliving their retirement savings (whether through personal savings or DC plans).

At the same time, seniors often find working longer rewarding. For example, in Japan, “according to a government survey, over 80% of seniors would like to work after retirement and contribute to the economy rather than be a recipient of government assistance” (Akiyama (2014)). There is also a growing body of evidence that longer working life is beneficial to seniors’ mental and physical health (CDC (2012)).

In contrast, there are several reasons why people may decide to ask for retirement income “early”. They include: inability to continue to work because of adverse health or a physically or technologically demanding occupation, desire for a phased retirement, underestimation of future retirement needs and personal life expectancy, lack of trust in their retirement programs, an inadequate understanding of the reduction in early retirement benefits, cultural practices, and personal preferences.

For example, in the United States, although the eligibility age was 65, rising to age 67, the most common age at which Social Security benefits is selected to begin is 62, i.e., the earliest possible age at which income benefits are available. This is partly because of a short-term view in light of immediate income needs, early retirement from employment, a lack of full recognition of the costs / benefits involved or likely life expectancy, and health status. This suggests that individual considerations will always affect those making the retirement decisions and illustrates the need for more effective information to enhance understanding of the implications of these decisions to the individual.

1.5. Role of the actuary

Actuaries are well positioned to play an important role in the changing retirement landscape at all levels of pension programs: social security, employer-sponsored pension plans, and individual savings and retirement planning (e.g., converting savings into retirement income). Actuaries are involved in the

financial analysis required for pension programs to adapt to our dynamic world, both as technical and policy advisors who provide sound and objective advice.

They can assist policymakers and employers assess the effects of a change to the eligibility age or the effects of other responses to changing conditions. The advice to pension plans sponsors and policymakers is provided taking into account objective forecasts, risk management and the issues discussed in this report, i.e., benefit adequacy, affordability, sustainability, inter-generational equity, intra-generational cross-subsidies, labour market, and other economic issues, considering social and political considerations.

To achieve these objectives, actuaries combine a macro-economic view with micro analyses to develop practical analysis and solutions and promote the use of reasonable assumptions and models from which to form the basis of policy recommendations. They also focus their attention and analysis over a long-term time horizon, consistent with the ultimate objectives of the plans and programs, as well as the interests of their various stakeholders.

The development of objectively derived and realistic actuarial assumptions and models are quite important. For example, assumptions regarding future longevity improvement are especially needed for sound decision-making regarding whether to increase the eligibility age of a retirement program. Projections of these improvements are highly uncertain and difficult to forecast, since past trends are not necessarily predictive of the future.

Over the last few decades many actuaries, along with other professionals, have underestimated longevity improvements. However, this estimation error should not lead an actuary to move to the other extreme of assuming unrealistically large future longevity improvement rates. While mortality assumptions are based partly on professional judgement, the actuary considers the latest developments in contributing factors such as causes of death and their future evolution, environmental impacts and medical advances.

In developing mortality and other assumptions, the actuary strives to achieve a balance between concerns that, on one hand, the financial sustainability of programs should not be jeopardised by underestimating future mortality improvements and that, on the other hand, overestimated mortality improvements may result in erosion of benefit levels and an intergenerational transfer of costs that will never materialize⁵. To illustrate uncertainties in mortality outcomes and their impact on the financial status of the program and on the level of benefits, actuarial analysis and disclosure usually includes a variety of sensitivity tests, which can also enable decision makers to better assess the effect of alternatives and options, and incorporate political, social and economic considerations.

Reviews performed on a regular basis (e.g., every one to three years) enable actuaries to monitor experience versus assumptions, and adjust the assumptions as warranted. Gradual adjustments in assumptions can help avoid drastic changes to benefits, contributions and eligibility ages, as well as other plan parameters. This can also provide policymakers more time to act and affected participants time to adapt to changes. In doing so, the actuary needs to effectively communicate the results of the calculations made and identify the main drivers of the expected outcomes.

⁵ Some countries, like Sweden, are trying to remove this uncertainty by using current mortality rates as a base for benefits calculations.

1.6. Summary

There are considerable differences in social security eligibility ages around the world. Moreover, countries have taken different approaches to providing inducement (or discouragement) for early or late retirement. The factors that underlie these different approaches include the weights given to the relative importance of sustainability, affordability, equity and economic implications. Social security policy involves trade-offs that are determined at the population or population subgroup level – not at an individual level.

Eligibility ages for employer-sponsored plans tend to cluster around the social security eligibility age. In addition to considerations of affordability and adequacy, the eligibility age and early / late retirement provisions in an employer-sponsored plan are affected by business objectives and labour market and economic conditions, as well as the desire to retire older workers to make way for younger employees.

The choice of retirement age made by an individual will depend upon the eligibility ages of social security and his / her pension plan, as well as on such factors as availability of employment, health, other financial assets and family situation.

There has been a clear trend in recent years in developed countries for the eligibility age and the age of retirement to increase, which brings us to the question: “why increase the eligibility age?”, the topic of the next chapter. Actuaries have been and will continue to be involved in the financial assessment of the sustainability of the retirement programs, including issues related to program design.

Chapter 2: Why increase the eligibility age?

2.1. Introduction

In this chapter we consider factors that can affect the choice of eligibility ages and why retirement ages are changing in many countries. These factors include the objectives and expectations of the program/plan, the actual and expected condition of those who contribute to and receive benefits, and the economic and labour environment. A change or reform of a social security program or employer-sponsored plan considers its three basic pillars: contributions, investment return where there are assets, and benefits.

Many developed countries are considering or have implemented increases in the eligibility age to their social security programs. Employer-sponsored pension plans may follow suit. The primary question addressed in this chapter is: Why is this change happening?

2.2. Population ageing

A great deal has been written about the demographics of the ageing of populations. As further background, examples of primary ageing components and other selected relevant demographic data are presented in the appendix.

Increases in longevity, especially at older ages, in combination with falling rates of fertility, have contributed in all developed and many developing countries to the ageing of the labour force and increasing old-age dependency ratios (the number of those who are retired relative to the labour force, often expressed in terms of those aged 65+ to those between ages 15 and 65), both with respect to the current labour force and projected future generations.

As Chart 2.1 shows, over the last four decades population pyramids in both more and less developed countries have changed dramatically. These are expected to continue to evolve in the future. The main driver of this change, with a few exceptions, has been falling fertility rates. In the aggregate, in more developed countries the number of children per female has declined from 2.8 children in 1950s to about 1.6 children in the beginning of the 2000s. Since then, a slight decrease in fertility has been seen in many of these countries, partly due to the timing of and recovery from the recession after 2007. Most national and international agencies project a relatively stable fertility rate for these countries, below 2 children per female in most cases.

The fertility story is different in many less developed countries, as the drop in fertility was much sharper, in the aggregate, from 6.1 children per female in 1950s to 2.7 children in 2005-2010 (United Nations (2013)). This overall decrease in fertility is expected to continue. Of course these averages mask substantial differences by country (for example, in many countries, especially in Africa, fertility remains between 4 and 6 children per female, with about 50 countries experiencing a fertility rate of 4 children per female and several countries experiencing slightly increasing rates).

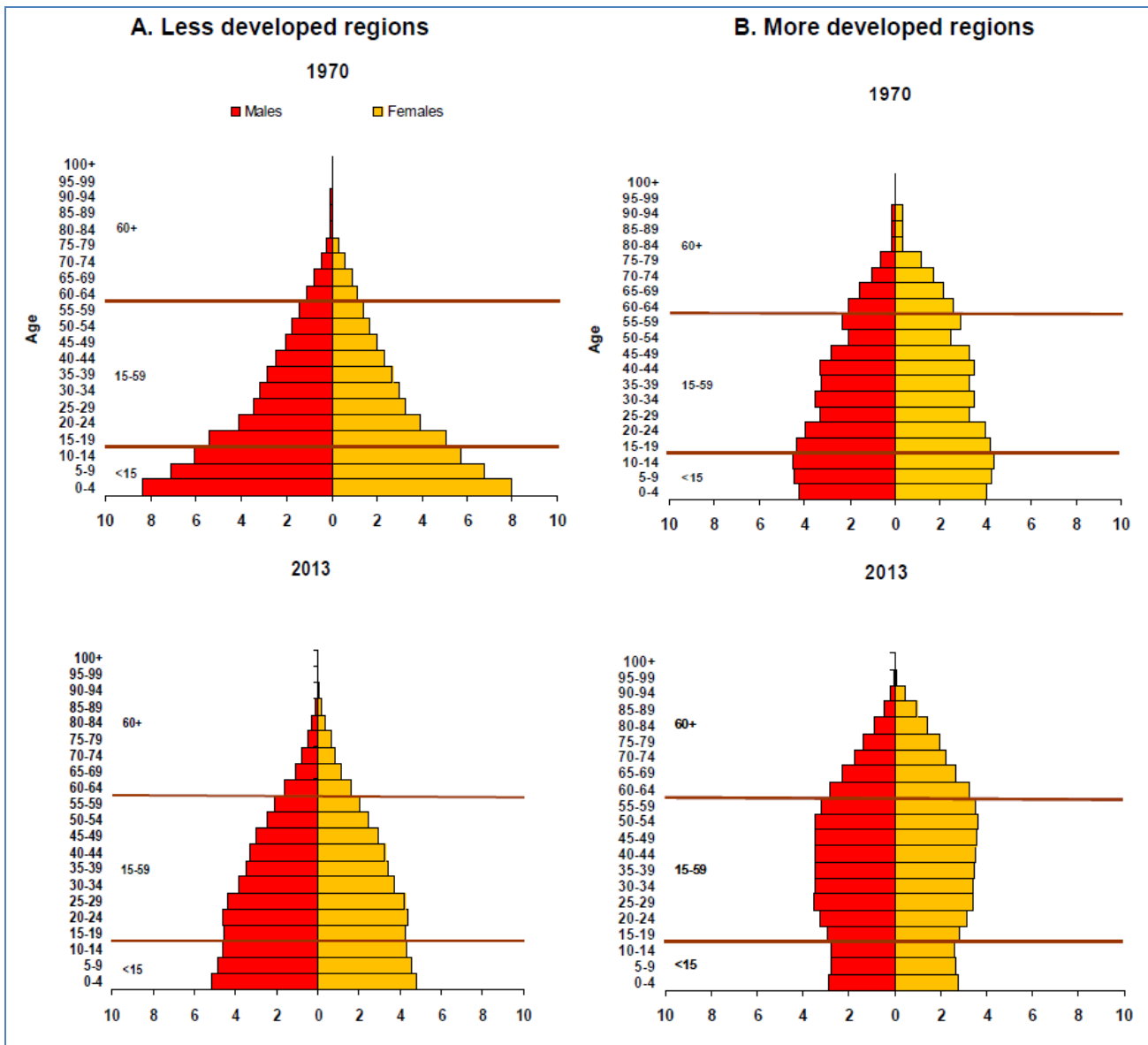


Chart 2.1 Population pyramids in 1970 and 2013

source: United Nations (2013) figure 1.6

The other side of population ageing is the increase in life expectancy because of lower mortality, especially at older ages. Chart 2.2 shows the increase in life expectancy at age 60 (based on calendar year mortality rates). This increase has and will continue to result in longer periods over which beneficiaries receive pension income benefits.

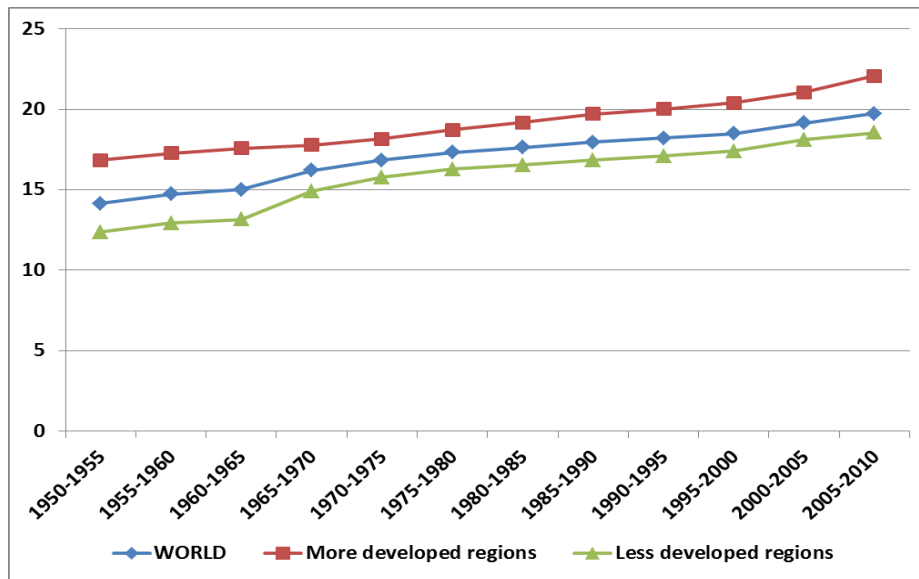


Chart 2.2 Life expectancy at age 60 (both sexes, calendar year mortality rates)
 source: based on United Nations Statistics, <http://esa.un.org/unpd/wpp/Excel-Data/mortality.htm>

2.3. Why does ageing adversely impact the sustainability of retirement programs?

Falling fertility rates eventually result in a smaller labour force and loss of contribution revenues for social security programs. Ageing has and will contribute to substantial decreases in the old-age support ratio (the reciprocal of the old-age dependency ratio) in most countries, with this process expected to continue (see Chart 2.3 that illustrates global trends in the old-age support ratio). Note that the trajectories after year 2010 shown in Chart 2.3 are projections developed by the U.N. Population Division, which may differ from national projections, although they usually indicate similar trends.

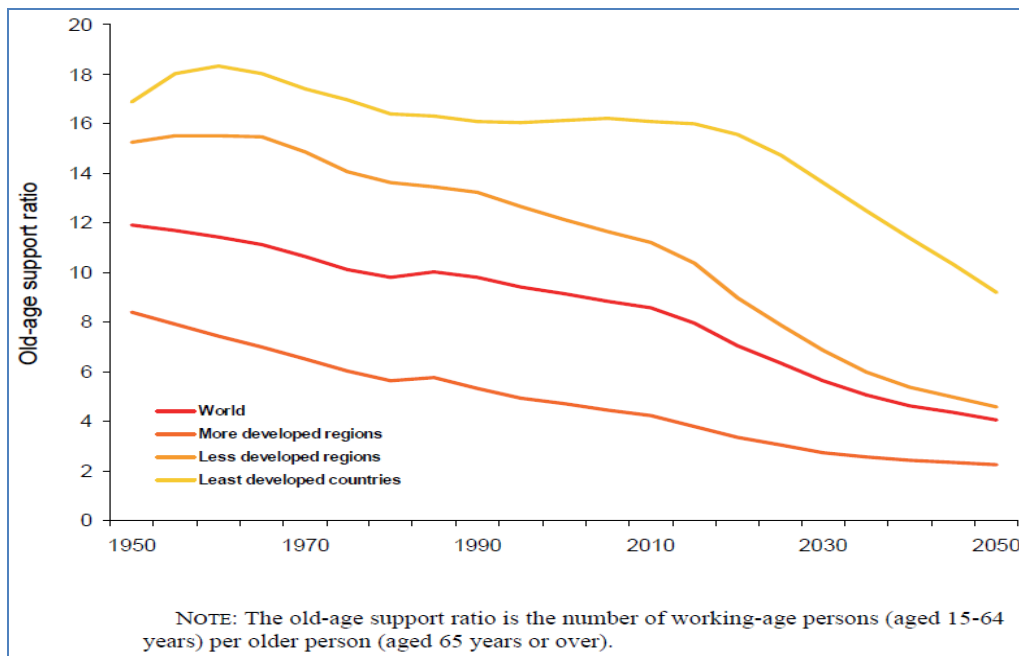


Chart 2.3 Historical and projected change in the old-age support ratio (the reciprocal of the old-age dependency ratio)
 source: United Nations (2013) figure 2.6

Increased life expectancy substantially affects all population groups, families and labour markets, as well as the financial condition of social security programs, pension plans, and health care systems. The resulting issues are multi-faceted, including cohort effects, inter-generational equity issues, labour issues, unemployment, economic growth, health care costs and lifestyles.

For retirement programs, whether provided by social security programs, employer-sponsored pension plans or individual savings, increasing longevity means relatively shorter accumulation and longer decumulation periods. Chart 2.4, based on data from Eurostat, shows expected durations of working life⁶ that can be used as a proxy for the accumulation period and life expectancy of a male at age 65 as a proxy for the decumulation period. Out of the 31 countries shown, the ratio of the length of the decumulation phase to the accumulation phase is 0.5 for nineteen countries, 0.4 for six countries, and 0.6 for the other countries. In fact, because these calculations do not take into account future mortality improvements, they underestimate the length of the expected retirement period⁷. Thus, in a majority of European countries, a male who takes his retirement pension at age 65 would be expected to receive retirement payments for more than half of the length of his working life. For females, due to their longer life expectancy, this ratio is even greater.

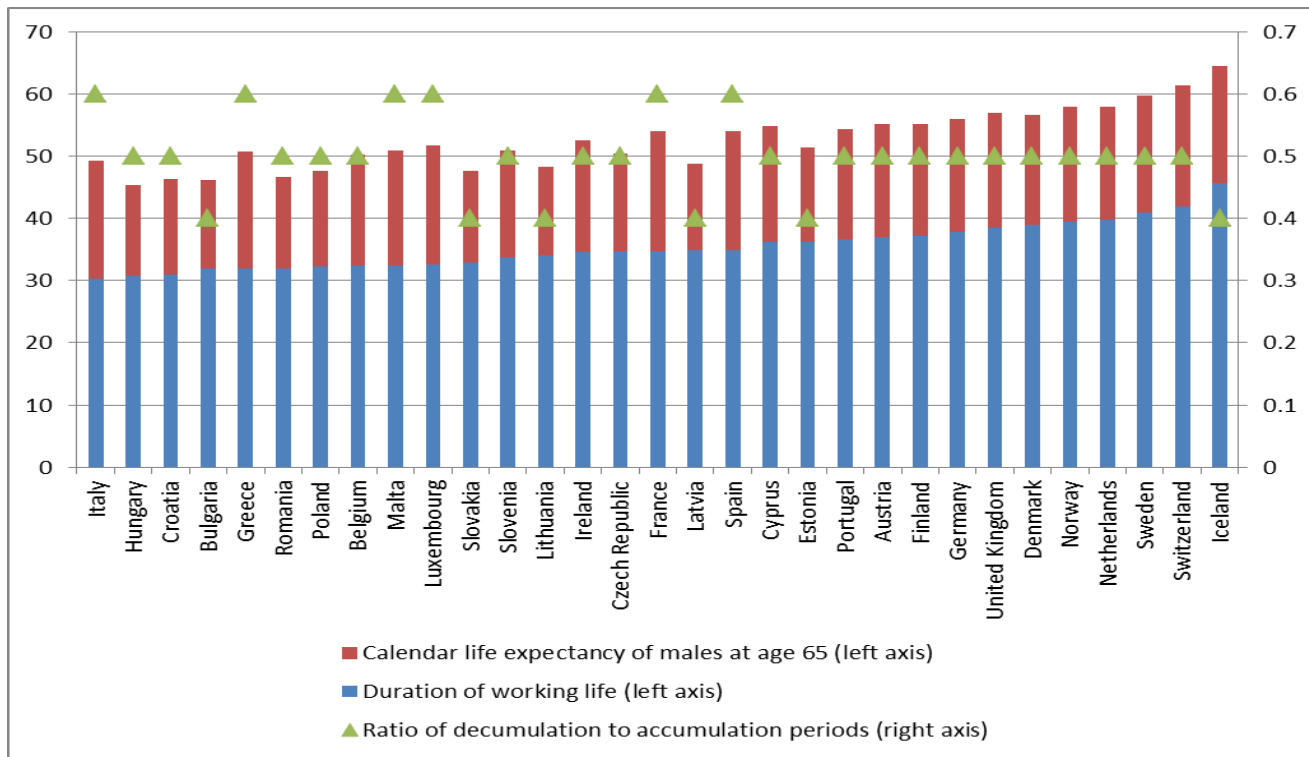


Chart 2.4 Accumulation and decumulation periods in selected European countries, 2013

source: authors calculations based on Eurostat data <http://ec.europa.eu/eurostat/data/database>

Long-term demographic issues can be aggravated by current, as well as expected future economic environments. For example, as a result of the global financial crisis beginning in 2007 a “new normal” world may have emerged, characterized by lower expected market returns, interest rates and economic growth. As this new world emerged, fully funded pension savings suffered an unprecedented shock.

⁶ The duration of working life indicator measures the number of years a person aged 15 is expected to be active in the labour market throughout life. This indicator is calculated by a probabilistic model combining demographic data (life tables available from Eurostat used to calculate survival functions) and labour market data (labour force survey activity rates by single age group).

⁷ Country-specific eligibility ages are not taken into account in this set of calculations.

For pay-as-you-go programs, the effects of such crises include loss of revenues due to increases in unemployment, as well as an increase in expenditures (i.e., for disability and unemployment benefits), as these programs act as mitigation tools, protecting the most vulnerable from the adverse effects of economic downturns.

Just as demographic and economic factors have put financial pressure on social security programs, they have also adversely affected the financial forces underlying both employer-sponsored pension plans and individual savings. Increases in longevity adversely affect the cost of employer-sponsored DB pension plans and raise the amount of funds needed to satisfy lifetime financial needs, although for longer term employees it might also lengthen the period over which contribution income can be invested. Economically challenging times will in many cases make it more difficult for employers and employees to contribute. Also if an employer-sponsored pension plan benefit design includes a linkage (e.g., integration) to social security benefits and the social security program's eligibility age is increased, then the eligibility age for employer-sponsored pension plans may also be increased.

For individuals, to avoid the risk of outliving one's pension benefits, there is no effective alternative to the use of some form of longevity protection, for both private and public programs. However, the demographic and economic forces discussed above make the most common form – immediate lifetime annuities - expensive for individuals and participants of DC pension plans.

In fact, an increase in the eligibility age can be beneficial for some participants, as it enables workers to gain additional years of work credits and increase their benefit amount, especially for those who have worked for a company for a limited period of time in a DB plan, or to increase monthly benefits for additional work years in a social security program.

2.4. Considerations regarding an eligibility age increase

In deciding whether to increase the eligibility age in response to concerns regarding the sustainability of a program or plan, several factors should be considered, including the following. Each topic is also discussed in more detail in later chapters.

Benefit adequacy

If the end of the accumulation period is not changed (i.e., the eligibility age is not increased, even though full-time entry into the labour force has been delayed due to increased schooling years and youth unemployment), either contributions have to be increased or benefits reduced, or both. There are, however, limits to the application of any single approach.

With respect to increased contributions, tax increases or wage deductions are never popular. There is a widespread view (not always confirmed by empirical evidence) that such increases may decrease economic growth as a result of decreased consumption. In addition, there is a limited amount of consumption deferral that individuals are willing to suffer in order to save for retirement.

Similarly, reduced benefits are not popular, as this may jeopardize their adequacy. For many individuals, a reduction in benefits from public or private pension plans, especially those previously relied upon, will result in an insufficient accumulation of wealth to provide for a comfortable retirement beginning at the current eligibility age and lasting through the end of life. Inadequate savings during working years has been further exacerbated in many countries by present and expected low investment yields. In the aggregate, inadequate benefits and wealth will lead to increased poverty

and reduced consumption of goods and services by many who are retired. Since, in most countries, the proportion of older people is projected to increase dramatically, not only will there be individual suffering, but this in turn will lead to slower economic growth.

When considering the implications of reducing benefits, it should be realized that, while it may be possible for the State to amend social security benefits accrued in regard to past service or contributions paid, it may not always be possible for such changes to be made by employer-sponsored pension plans, depending on legal requirements and union / employee pressure.

Additional pressure on benefit adequacy has arisen because of a lack or reduction in coverage of employer-sponsored pension plans, as well as the continuing trend of replacing DB plans by DC plans. For example, the Canadian Institute of Actuaries' (CIA) Task Force on Retirement Age (2013) reported that since only 39% of workers are covered by registered pension plans, a majority of workers will not benefit from employer-sponsored pension plans after their retirement age. It thus concluded that expected working life for Canadians will increase "...regardless of public policy".

Inter-generational equity

In general, retirement programs, especially social security programs, need to balance the rights and needs of different generations of individuals to manage their longevity risks, as well as to consider both voluntary savings and employer-sponsored pensions. In doing this, inter-generational equity and transfers should be considered. In particular, in pay-as-you-go social security programs where the contributions of one generation pay for the retirement benefits of another generation, this balance of interests should be addressed.

As highlighted in Menard et al. (2013), the young may feel that the "equity balance" has shifted too much in favour of the older generation, especially in an aging population. If left unmitigated, future pension costs will put a substantial strain on public finances. If continued, such an imbalance could eventually increase the cost burden and limit the economic potential of younger generations, thereby exacerbating inter-generational conflicts.

These challenges were highlighted in the European Commission (2012) budgetary projections for pensions, health care, long-term care, education and unemployment in light of the ageing population in Europe. Although significant uncertainties exist regarding the economic assumptions inherent in its cost projections, projections over the medium to long term show a steady increase in age-related spending. Interestingly, the European Commission (2015) projects lower increases in pension expenditures, partly as a result of pension reforms, including increases in the eligibility age, enacted in European countries in the interim.

Lower fertility rates and longer longevity lead to and accentuate inter-generational and intra-generational equity concerns. The issue of a smaller working generation and a larger older-age dependent population can lead to a more unequal distribution of income and wealth across generations, including the effects of decreased participation in DB pension plans and relatively smaller private savings of those yet to retire. Thus, this issue is of significant social and economic importance. Market failures, budget and private sector profit concerns, as well as differences in political views, have limited the ability to provide full or even an adequate funding of benefits. The private sector and society (through government, as a proxy societal decision-maker) should increase their involvement in determining the extent of protection offered to individuals and groups, although unpopular decisions will inevitably have to be made as budgets tighten. Actuaries, in addition to quantifying various aspects of this income sharing, can contribute substantially by identifying and measuring these associated risks.

Further discussion of inter-generational equity is provided in Chapter 3.

Labour market and economic growth

The exit of large cohorts of retirees from the labour market can lead to labour market disruptions, even labour shortages. As discussed in Chapter 1, in many countries more individuals are choosing to retire at older ages, which can somewhat mitigate or delay this effect. Current and expected future increases in healthy life expectancy are resulting in the ability and willingness of many individuals to continue working at older ages. However, in aging countries, recent trends in delayed retirement alone may not be sufficient to maintain their economic growth. The ultimate solution may lie in the continuous increase in labour productivity (this topic is outside the scope of this report) or immigration.

Governmental decisions on the design and implementation of retirement policy can, either directly or through retirement, tax, labour, and economic legislation and regulation, significantly affect aggregate economic performance and outputs. Such intervention can be quite influential, particularly in labour markets, affecting companies, employment and individuals.

From the viewpoint of enhancing economic performance, it is important in many areas to take advantage of the experience of older workers. This is the case even if many of those at older ages are only able to perform at a less productive level, depending on the demands of the particular job market and the overall employment conditions.

Effect on individuals

As discussed elsewhere in this report, increases in life expectancy are often closely linked to an increase in the expected and actual retirement age and the eligibility age of social security programs. Decisions regarding an increase in eligibility age, however, have not always considered their effects on individual retirees (and their family members) who have significant current or potential health issues or shorter life expectancies. Further, both life expectancy and healthy life expectancy can significantly differ among males and females, among population subgroups, as well as by socio-economic subgroups. Differences in healthy life expectancy are often greater than those in basic life expectancy.

Work-related issues, such as closedowns, restructuring, outsourcing and an individual's technological obsolescence, can affect retirement decisions. In addition, if there is a difference in the availability or affordability of health care services before and after retirement, this can also be a consideration.

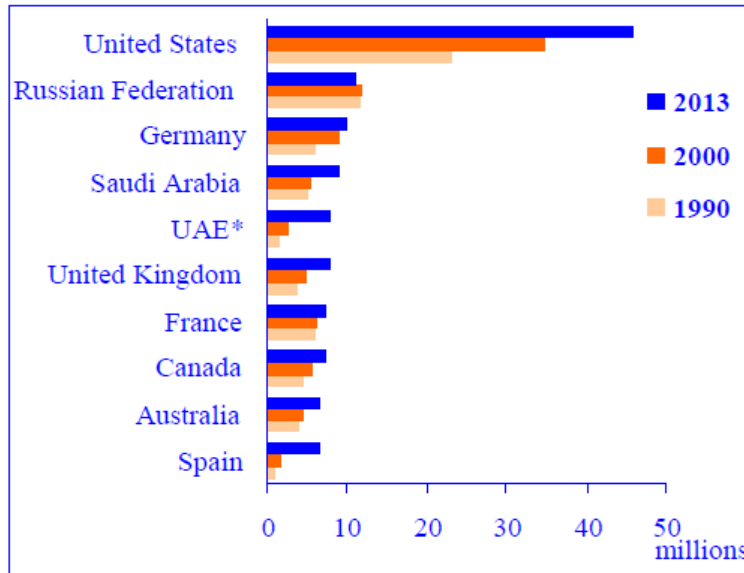
Although differences between individuals can be greater than between groups, it is generally considered to be inappropriate to recognize individual differences in determining eligibility ages.

Further discussion on population group and individual equity is provided in Chapter 3.

Immigration / emigration

The number and characteristics of migrants can impact retirement income programs of both the country of origin and the destination country. According to United Nations' statistics, in 2013 the number of migrants living in a country different from their home country reached 232 million. The stock of international migrants is affected by political, economic and demographic factors, as well as disasters such as wars and famine. A recent example is the large number of migrants from the Middle East and Africa moving to Europe due to religious conflicts and economic factors. Chart 2.5 shows for selected

years the ten countries hosting the majority of migrants. As it can be seen from Chart 2.6, the majority of migrants of working age reside in developed countries.



* United Arab Emirates.

Chart 2.5 Ten countries with the largest number of international migrants as of 1990, 2000 and 2013 (millions)

Source: United Nations (2013-1)

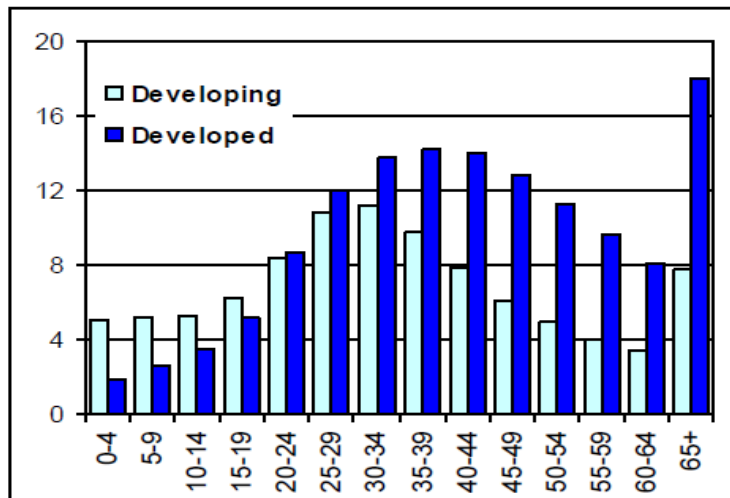


Chart 2.6 Age distribution of migrants in developing and developed regions, 2013 (millions)

source: United Nations (2013-2)

The retirement behaviour of migrants depends in large part on their residency status, the age at which they entered their host country, their family situation and their ability to contribute to and to draw benefits from retirement plans of either host or origin countries. For example, permanent migrants who contribute to one or more retirement plans in their new country are more likely to delay their retirement in order to earn more adequate benefits in the future. Countries with a large number of migrants as a percent of population should consider these issues and experience in developing eligibility age policy. It should be noted that working age migrants can provide additional funding for social security programs of host countries either directly by contributing to these programs, or indirectly by paying

taxes. Examples are Canada and the United States where temporary migrants contribute to social security programs but do not always receive benefits.

General

Studies of the relationship between eligibility age and life expectancy have usually taken alternative perspectives or cover a single aspect of this issue. Most have tended to focus on a single variable, attempting to unravel the causes and effects involved, usually concluding with policy recommendations reflecting the specific perspective taken or issue analyzed. Examples of such reports are:

- The CIA Task Force on Retirement Age (2013) report on Increasing the Retirement Age sees merit in limiting early retirements; and
- Modugno (2012) compares pension wealth under DB and DC plans and their effect on early retirement.

In contrast, the overall picture is complex (see Barr and Diamond (2006) for a further discussion). Social security programs are often viewed as vehicles that facilitate the allocation of income over participants' lifetimes between their working and retirement periods. These programs also usually play an important role in redistributing resources from the wealthy to the less well off in society. In addition, they may have a macroeconomic objective aimed at maintaining a sustainable old-age dependency ratio of the nation. Individuals' decisions about fertility and their retirement age indirectly affect and are affected by the choices made by other members of society. If possible, society should strive to reach a sustainable condition.

Late retirement may also involve higher human resource (HR) costs, such as those associated with modifying the structure of the workplace, legal, labour and contractual constraints, continuing education and retraining, and career and succession planning. Factors to be considered also include decisions regarding lifetime allocation of leisure, empowerment of individuals, optimal uses of resources at all ages, impact on family and flexibility in life styles, mobility, and income and risk sharing.

Since for society as a whole, and policymakers in particular, macro-level issues are often crucial, the design of retirement programs and decisions, including setting the eligibility age, are often based on aggregate macroeconomic and macrodemographic assumptions. For example, as discussed in Chapter 1, actuarial adjustments for taking early or late retirement in the Canada Pension Plan are based on macroeconomic assumptions and are actuarially cost-neutral on an aggregate basis. An individual deciding when to retire will consider the amount of the adjustment applied to social security benefits – not whether the adjustment is actuarially neutral.

While considering the effect of individual choices on retirement age, actuaries and policymakers need to consider not only retirement provisions, but other affected programs, including delivery of social welfare and health care services, if applicable.

Pension entitlements are not money. Rather, they are claims on resources, with their sustainability depending on the perceived fairness of shared economic output. This involves, especially for social security and government planners, the dual issues of (1) future economic and demographic developments and (2) cross-subsidies between generations and population subgroups. These involve perceptions of sharing contributions with society and the economy, given equal opportunity and endowments. Thus, society has to address how longevity bonuses should best be shared between one's

working career and retirement, as well as with society as a whole – even if some individuals prefer a lower standard of living while working to “earn” more while in retirement.

2.5. Summary

Increases in longevity and decreasing rates of fertility have led to the ageing of the population in many countries. As a result, the old-age dependency ratio is increasing. Also, recently the disappointing results from investment markets and low interest rates have put further pressure on social security programs, employer-sponsored pension plans and individual savings.

This financial pressure could lead to reduced benefits and / or increased contributions / taxes. Another way of mitigating the effect of these factors is to increase the eligibility age, which can also be seen as reducing inter-generational inequity arising from increased longevity. Increasing the eligibility age also helps ensure that the skill set of more experienced workers is retained, with less disruption to the labour force.

Nevertheless, certain population sub-groups (for example, those who are in poor health and those working in more physically demanding or rapidly evolving technology occupations) may not be able to extend their working life, and assistance in meeting their needs may have to be borne by supplementary programs.

Migration can have both positive and negative impacts on retirement income arrangements. Because recent migrants are often relatively young, they can enhance the funding of these programs. Policies of countries should take these effects into account.

Chapter 3: Assessing the fairness of a change to a social security program

3.1. Introduction

In this chapter we discuss the assessment of possible changes to a social security program made in response to adverse demographic shifts that threaten its financial sustainability. This assessment includes both benefit adequacy and actuarial fairness with respect to population subgroups and multiple generations.

A comprehensive discussion of equity and sustainability cannot be limited to retirement income programs alone. A broader framework encompasses consumption, education and health care, as well as any resulting debt left to future generations and their effects on the economy and on employment. However, such a discussion that includes all of these elements is outside the scope of this report.

As expectations are naturally culturally and socio-economically based, they can differ both between countries and between the make-up and culture of population subgroups and generations. They will also be influenced by the nature and history of the current program, which inevitably shaped how personal long-term financial planning and company human resources' career planning is conducted.

Such a multi-faceted assessment is necessarily based on a set of norms or objectives, established when the program was initiated and probably updated as time passed. Periodic reviews of retirement programs and the needs of their stakeholders under alternative scenarios are necessary, as relevant demographics, environment, economics, political and societal values change in a dynamic manner.

This is even more challenging for social security programs and large employer-sponsored retirement plans because of their size and long-term nature, covering multiple generations and usually a heterogeneous population (e.g., by age, family situation, socio-economic status, health condition and prospects, ethnicity and personal savings history).

When considering an employer-sponsored pension plan that employees may be able to join or to voluntarily contribute to, it could be argued that workers participate according to their value of money and time. But when joining is mandatory (or semi-mandatory), as in social security programs and many employer-sponsored pension plans, it is desirable to be fair to as many participants as possible.

The concept of fairness can take on disparate meanings, depending on who you are and what your cultural / social values are. As fairness is a relative and not absolute concept, it can also be used to compare the effects of a program, or changes to it, on multiple population subgroups. Objective comparisons usually consider both expected contributions and benefits, as well as all available resources, not just those directly related to the program.

Although public or private programs may not treat everyone precisely in accordance with each individual's situation, to the extent they balance certain fundamental principles and objectives in a reasonable manner, they can be viewed as being fair overall. Criteria by which to assess program objectives may include:

- (1) Provision of a minimum floor of protection, in absolute levels or relative to the needs of the beneficiaries, sometimes referred to as "social adequacy";

- (2) Provision of benefits related, although not necessarily proportionally, to the amount of contributions; and
- (3) A targeted structure for and amount of inter- and intra-generational transfers.

These criteria often conflict, especially when a social security program is financed on a pay-as-you-go basis through contributions or through taxes not explicitly earmarked for this purpose. Employer-sponsored pension plans emphasize the second of these principles, while social welfare programs emphasize the first and third.

Many social security programs were not designed to provide for the total financial needs of all retirees and their families. Rather, such programs are usually primarily intended to provide a minimum base of protection for all participants. Social security programs are often expected to be supplemented by private (by the individual or through employer-sponsored pension plans) savings and work income. For those whose resources from all these sources do not maintain a minimum standard of adequacy in the eyes of society, some countries also provide social welfare assistance (means-tested or otherwise).

Proposed program changes can be viewed in isolation or in combination with the six possible sources of financial resources that may be available to beneficiaries: (1) social security benefits, (2) social welfare benefits, (3) employer-sponsored plans, (4) personal savings and other financial resources including owned housing and private insurance, (5) current and future wages and income and (6) available resources of family members and community.

3.2. How to quantify fairness

To assess the relative fairness between (1) a proposal for change and the current program or (2) the effect of a proposal for change on two population subgroups or across generations, one or more benchmark metrics may be usefully applied on the basis of real or hypothetical individuals. The present value of expected net cash flows is a common measure to assess actuarial neutrality of contributions and benefits. Other commonly used metrics for these purposes include: (1) replacement ratio comparisons, (2) a money's worth comparison, (3) relative expected benefits levels and (4) the affordability of contributions to average wages.

Other metrics may also be useful for this purpose, such as a comparison of benefits for the various population subgroups to program objectives. The metric most useful for this purpose depends on the design objectives being assessed. These metrics, further discussed in Chapter 5, can also be used as indicators of the sustainability of the program or affordability of a package of benefits.

3.3. Benefit adequacy

The adequacy of benefits should be assessed in comparison with the needs they are designed to satisfy, with or without other available resources. A minimum level of benefits can be provided to all participants or benefits can be provided only to those who demonstrate a need for such support, e.g., through means-testing.

However, it is difficult to determine the needs of individuals based on any formula, and certainly not one based solely on age and gender. The amounts and types of benefits are usually established and subsequently modified through the lens of what is perceived to be the objectives of the programs and participants' financial needs, reflecting the then societal and political values regarding the balance between affordability, benefit adequacy and sustainability. The program's objectives and assessment of

financial needs are often established with respect to broad population groups and their financial characteristics.

An important element in a plan's design is the eligibility age, the principal topic of this report. As indicated in earlier chapters, the eligibility age can be determined in at least two ways: a single mandatory age, possibly varying by gender, type of job (e.g., blue collar or white collar in an employer-sponsored pension plan) or within a range of ages as selected by the individual, reflecting a given set of criteria (e.g., type and length of time in a job). Benefits are usually expressed in terms of a defined amount available to a participant at the eligibility date, with a reduction on an actuarially neutral or other basis for earlier retirement and an increase for late retirement. The concept of fairness of benefits as applicable to these dates will be discussed in the remainder of this chapter.

Personal savings are often insufficient for retirement years, especially when retirement begins at younger ages. Even in disciplined Singapore, social protection may prove insufficient. In Singapore, the provident fund account at age 55 represents a basic retirement amount, equivalent to the cost of buying an annuity at age 65 to meet the average living cost of those in the second-to-lowest quintile of incomes. In fact, in 2013, 45% of those reaching age 55 did not have that amount accumulated.

The balance between current consumption and contributing to savings until retirement is often difficult. The longer it takes to begin receiving benefits, the more difficult this trade-off is. Thus, some believe it is preferable to enable participants to have access to personal savings intended for retirement purposes to meet unanticipated pre-retirement needs (e.g., in the United States through loans against 401(k) accounts). In Vietnam in 2015, the decision of the government to eliminate the possibility of receiving lump-sum payouts instead of retirement benefits at termination of employment provoked unprecedented strikes. The youthful population found it unfair that the government withholds a portion of workers' wages until retirement, which for some is far into the future. The issue in Vietnam was exacerbated by the lack of confidence in the government to provide for their needs.

In spite of this concern, cashing out personal retirement savings may result in inadequate retirement benefits, higher reliance on social security and social welfare programs, and what may be an involuntary longer working life.

3.4. Inter-subgroup fairness

As mentioned earlier, the fairness and suitability of a social security program is often expressed in terms of the relative level of adequacy and accessibility of benefits in relation to the program's objectives and participants' needs.

Needs are assessed with respect to several factors, including (1) current and expected future health status, (2) current and expected financial resources, (3) dependents and survivors, if any, and (4) current and future support received from other sources, if any. A full assessment cannot be comprehensively conducted at a policy level without considering the wide variety of individual circumstances. However, because an individually-based assessment is essentially impractical, it is usually performed on population subgroups or generations of participants. An important feature of an inter-segment fairness comparison is the recognition of the significant tension that often exists between the needs and resources of different population subgroups, for example, the rich and the poor, those with different health status, citizens by birth and immigrants, and between ethnic groups. The focus of this section is on inter-subgroup fairness related to eligibility age determination.

Mortality rates and health status of population subgroups can differ significantly by numerous factors, including level of income. Chart 3.1 shows life expectancy and healthy life expectancy in the U.K. by income deciles (Office for National Statistics (2013)). While the difference in life expectancy at birth between those in the highest and lowest deciles of income is very large (about 9 years for males and 7 years for females), the variability in the number of years in good health is even wider: about 18 years for males and 19 years for females.

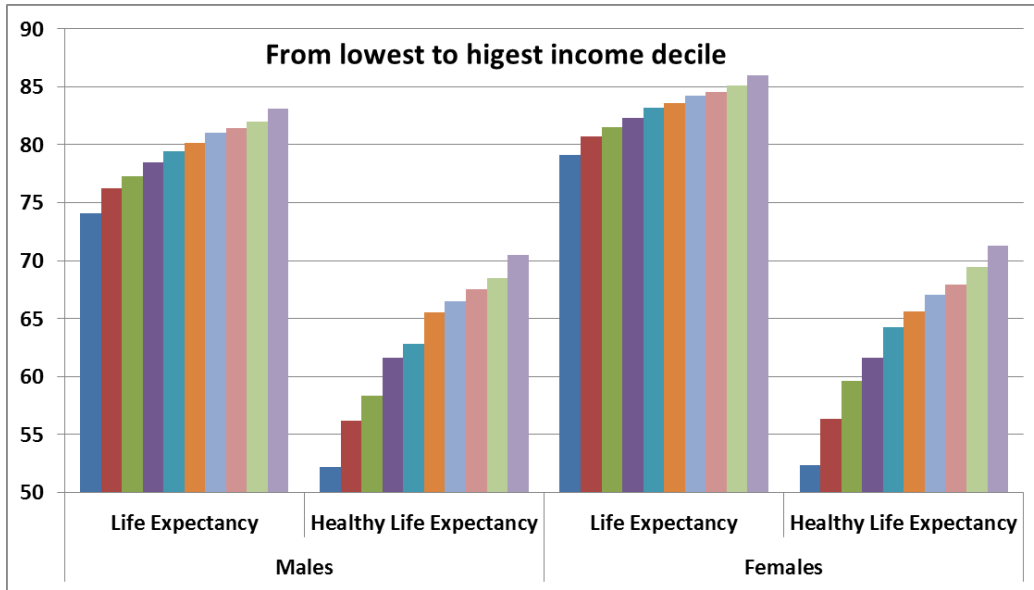


Chart 3.1 Life Expectancy and Healthy Life Expectancy at birth by income deciles, U.K., 2011-2013

This variability in life expectancy, regardless of the additional variability resulting from other factors, complicates the assessment of fairness of the eligibility age determination for a social security program that must cover all population subgroups in a country. With many population subgroups, each with its own resources, expectations and demographic characteristics, the assessment becomes a multi-variable and multi-criteria problem, whose solution can at best only be approximated, thus involving possibly multiple compromises. For example, those who are expected to live relatively short lives in retirement will in some respects subsidize groups expected to live longer. On the other hand, those with a longer life expectancy run the risk of outliving their savings not in the form of a defined benefit pensions or lifetime annuities and may face a drop in income during later years when they may need more resources and care.

Inter-population subgroup conflicts can also arise, which emphasizes the fundamental importance of approximate fairness between individuals and groups. Unfortunately, it is impractical to achieve total fairness because of the unique needs of subgroups and individual circumstances. Many social security programs thus provide additional benefits to specific population subgroups (e.g., the poor and the disabled) and mitigate some of the adverse effects of specific life events (e.g., loss of earnings due to periods of child-bearing, long-term illness, unemployment, or survival of a working spouse / partner with or without dependents).

The Employee Benefit Research Institute (2015) found that about half of surveyed U.S. retirees left their jobs sooner than planned, with more than half of those leaving because of disability, a health issue or the need to care for someone close to them. A significant percentage was forced into early retirement by layoffs, downsizing or other work-related issue.

The use of a single eligibility age might imply that everyone's retirement income under the program begins at the same calendar age, which may not be the case. In an attempt to offset individual differences, early and late retirement, disability and unemployment, as well as dependents and survivor benefits, are often provided by a social security program (in some cases supplemented with a social welfare program).

To more directly consider differences in the physical or mental stresses developed over a working lifetime with respect to health conditions and financial resources, some countries provide for a range of eligibility ages, specifically representing early and late retirement. This can facilitate early or phased retirement by providing differing levels of benefits at each age, with implicit incentives for early / late retirement, if so decided. This incentive may be made through credits or debits, as applicable, or by having a slope of benefits by benefit inception age on an actuarially neutral or other basis. For example, those who are partially disabled (and thus having a shorter life expectancy) but still able to work might choose or be forced to begin receipt of benefits at a different age.

Fairness in expected benefits across population subgroups can be achieved through the use of actuarially neutral adjustments, which means that the program is neither advantaged nor disadvantaged by the choices made by participants with respect to their retirement age. Determination of such actuarial neutrality should not only be based on objectively identifiable economic and demographic actuarial assumptions, but also reflect the effect of human behavior, such as adverse selection that can occur in comparison with a similar situation under which no election option is available (i.e., potential gaming of the system).

Accurate behavioural assumptions can be developed on a sound basis only after the actuarial factors have been in place for a reasonably long time so that sufficient experience has been obtained, and even then only after the effect of a range of economic conditions has occurred.

To the extent that actuarial neutrality is not achieved, the program is said to include cross-subsidies among population subgroups. These cross-subsidies are more common in public plans and in private plans affected by law or regulation limitations on levels of benefits and contributions. If clear and understood by all, then broad population systems such as social security can defend some cross-subsidies philosophically and practically.

3.5. Inter-generational fairness

Because of differences in perspective across generations and political realities, it may be impossible to find a common definition regarding what constitutes inter-generational fairness or equity, let alone achieving it. Nevertheless, inter-generational fairness issues can be simpler to address than inter-population subgroup differences, in that generational differences are only affected by time of birth, while inter-population subgroup differences are affected by multiple factors.

A social contract between generations is the basis for a sustainable social security program, which can continue only if each generation agrees to honor the financial obligations created by past generations, in the expectation that subsequent generations will do likewise. This concept is not easily applicable to an employer-sponsored plan.

In considering inter-generational fairness, it is important to decide whether the goal is equal outcomes or equal burdens. In an attempt to measure whether fairness is being achieved, either the expected amounts of monthly benefit or the present value of total benefits are compared for those of different

birth years. Since life expectancy has increased over time, if each generation is to be provided an equivalent present value of benefits at the same eligibility age, then each subsequent birth cohort should be provided with lower monthly amounts of benefits than the prior one (on a real basis, i.e., reflecting real interest discount or adjusting for any cost of living increases).

Nonetheless, such a decrease in monthly benefit amounts will likely be perceived as being undesirable, as nearly everyone wants to provide more or at least as much for their children than they have received. In addition, since most people compare the amount of benefits received each month rather than their present value, participants will naturally perceive any reduction in monthly benefit amounts over time as a true benefit reduction, regardless of whether the benefits are actuarial neutral and fair. This is the case even though comparing benefits expected to be received over their lifetime is technically more accurate. Nevertheless, especially when a pay-as-you-go approach to funding is used, concerns regarding affordability and sustainability may need to be addressed through contribution increases, benefit reductions or increasing the eligibility age.

One approach to address some of the political and social concerns regarding unfair benefits by generation is to incorporate automatic adjustments to the program's provisions (including eligibility age) that could be triggered by an index responsive to the changing environment that affects program sustainability or benefit adequacy, primarily longevity improvements, ageing and changes in cost of living.

Historically the family supported the elderly, often in return for assistance with child care. However, lower fertility and mortality rates, the ageing of the population, increased mobility, and changing social values, have often effectively made sole reliance on the family a relic of the past. It is thus now almost universal practice for governments to provide some form of a safety net for this support through social security or social welfare programs. Consequently, most social security programs providing retirement benefits became fundamentally wealth transfer schemes between generations, where contributions today do not necessarily "buy" sufficient benefits for their contributors.

Indeed, the reality is that many of the current working generation in many countries believe that previous generations, especially those living in what is perceived to be the relatively prosperous second half of the 20th century, provided themselves over-generous benefits (at least as viewed in retrospect), which can result in a burden for current and future generations. In addition, many in the current working generation, especially those in middle and lower income classes, find it financially challenging, especially during long periods of unemployment, to set aside enough funds for their own future retirement income benefits and for care for their children, let alone for paying benefits for current retirees. Thus, required transfers between the three current generations (children, working adults and retirees) are threatened. In fact in some countries there can be greater poverty among those working than among pensioners.

3.6. Actuarial fairness relative to contributions

Fairness of a program from an actuarial perspective can be achieved to the extent that benefits provided to participants are directly based upon the contributions they or their family make to the program.

In contrast, social welfare benefits that are a part of a social safety net program are often means-tested and do not attempt to maintain actuarial fairness. Thus, the purpose of a social welfare program is more attuned to social adequacy (i.e., minimum benefits based on need). Social security programs, with both actuarial fairness and social adequacy aspects, can redistribute income to some extent to those who, for

whatever reason, have not sufficiently prepared financially for an adverse event or condition (for example, illness, longer-than-expected lifetime or unemployment). Ideally, this combination will result in society fulfilling its obligations to its disadvantaged members while at the same time achieving a reasonable level of actuarial fairness.

Actuarial fairness is an integral element of, for example, a fully funded savings plan and most employer-sponsored pension plans where benefits are a direct function of contributions. Some countries (e.g., Chile) have privatized some or even all of their social security programs. In such a case, a separate safety net usually provides a minimum income support level for all. In other cases, there may be separate programs or distinguishable parts of a social security program, with one element providing a basic floor of protection for all (for social adequacy purposes), accompanied by a supplementary wage-based benefit program (consistent with actuarial fairness).

3.7. How can an increase in the eligibility age be fair?

When action is needed to maintain the financial sustainability of a social security program, there are many options to consider, including changing eligibility, program design, contribution rates and benefits. Although there is no single option or combination of options that would resolve such a situation that may be desirable from a public policy perspective, one or more changes may be necessary. A common approach taken is to increase the eligibility age – the fairness of this approach is now discussed.

Increasing the eligibility age of a social security program is currently a leading option to maintain the sustainability of such programs, especially if concerns related primarily to improvements in life expectancy. Its implementation should consider fairness issues, involving social adequacy, actuarial fairness and fairness across population subgroups and generations. A change in eligibility age may be accompanied by changes in other program design features, including adjustments in early retirement features and disability benefits, and even changes to other related programs.

A common view of an increase in eligibility age is that it represents a reduction in total benefits that will be paid to an individual. A contrary view is that because of increases in longevity, a delayed eligibility age will result in stabilizing the ratio of retirement period to the contribution period, and/or amount of expected total benefits over an individual's remaining lifetime at time of eligibility, especially given the later entry into the labour force of many of today's youth.

Since a social security program's objective is to ensure minimum financial security throughout participants' retirement, if in the aggregate we remain healthier and live longer, it is logical that social security benefits should begin at a later age. Nevertheless, there will remain a significant portion of the population who will be disabled or have multiple adverse health conditions, have inadequately saved and thus need more than the minimum benefit level, or be unable to work on a full-time basis at ages prior to reaching their eligibility age. These people will need social protection during the time between their retirement and the eligibility ages, as well as possibly afterwards.

As would be expected, a later eligibility age will inevitably face significant political opposition, in part because of the importance of and reliance upon the program for financial well-being by so many people. Nevertheless, as countries' old-age dependency ratios continue to increase, more countries have responded to deteriorating financial health of their governmental budgets and social security programs by adopting an older eligibility age.

Examples of different approaches to address this social challenge include indexing eligibility age to longevity (e.g., the Netherlands), a fixed schedule of eligibility age increases with a long lead-time (the United States and Canada) and moving away from the notion of an eligibility age (e.g., Sweden). More discussion on possible approaches is provided in Chapter 4.

It is virtually impossible that the decision to increase the eligibility age will be considered fair by everyone. On one hand, the younger generation may feel it is unfair if the current older generations who are benefiting from increased longevity are not asked to contribute their share by working and contributing for a longer period to their social security programs. Eventually, assuming continued mortality improvement, many in the younger generation will have to work longer themselves to support their own increased expected longevity. How can they be blamed for feeling short-changed if they are exposed to the double burden of paying for the longer retirement of their parents while working longer themselves to lighten the burden on their children?

On the other hand, many current participants in the social security program believe they are entitled to benefits at the same magic age, such as 60 or 65, as former generations, as they had set their life-cycle expectations based on such an assumption. It is also widely felt that retirement represents a reward for a lifetime of work. Thus, even in the case when ample lead time is given to allow individuals to plan for a change, an increase in the eligibility age is often considered as renegeing on past promises.

In spite of this, if life-cycle contributions and benefits are viewed from an inter-generational equity viewpoint, such a change – when determined consistent with the increase in life expectancy from the eligibility age – can treat different generations in a similar manner. Increasing the eligibility age can provide incentives to work for the same proportion of their lifetime as was the case in prior generations.

In assessing the overall fairness of an increase in the eligibility age, not only average expected longevity (overall and by population subgroup) should be considered, but also individual situations, particularly because health, dependencies, financial needs and expectations of individuals and their families differ dramatically.

Since those whose jobs are physically demanding or the disabled also tend to have a shorter life expectancy, an earlier age of retirement would seem doubly desirable. A response to this issue might be to enhance disability benefits, where available, or provide early retirement benefits on a reduced basis. Care may be needed to implement such a program, as it may lead to several consequential problems: (1) moral hazard and fraud in demonstrating a disability, particularly if the qualification requirements for such benefits are vague, which may represent an opportunity for abuse and (2) discouragement of productive work at older ages that can in turn reduce economic activity and growth. Another example, discussed in more detail in Chapter 5 exists in France where eligibility age is flexible and takes into account periods of strenuous occupations.

3.8. Summary

In assessing the need for a change in a social security program due to concern with its sustainability in large part due to gains in longevity and reductions in fertility, a change in the eligibility age should be considered. However, it is important that the effect of such a change on population subgroups that may be relatively disadvantaged and on different generations be reviewed to determine the extent to which actuarial fairness should be maintained. Possible alternative changes to either or both contributions and benefits should be assessed in such a review, as well as the use of disability and social welfare benefits. In particular, this is appropriate for workers in physically demanding occupations or those in ill-health

who are unlikely to be able to work to a higher eligibility age; for those in the former category, enhanced career planning and changes in job content may alleviate the effect of transitions to retirement.

An assessment of resulting incentives is needed to ensure that adverse unintended consequences (e.g., lack of individual saving or unwillingness to continue working) do not result for particular groups. Similarly, inter-population and inter-generational consequences should be considered based on a wide range of circumstances by use of some of the metrics described above.

Social security systems should contain a combination of adequacy (a minimum floor of protection, which involves redistribution of wealth) and actuarial fairness (which involves some relationship between contributions and benefits).

Not increasing a country's eligibility age for social security as the population ages is a policy choice with consequences (decision-making by default), both on the social security program and the nation's GDP. Without action, actuarial fairness and equity between generations will gradually deteriorate as time goes on.

Even if action is taken, the dynamic nature of population factors such as longevity improvement, low fertility and differential mortality between population subgroups and generations, will result in regular reassessment of the relative fairness of the program. Several countries have responded to this by adopting automatic adjustments to longevity improvement, just as others have implemented automatic cost of living adjustments.

Ultimately, it comes down to considerations of affordability, sustainability, benefit adequacy and fairness between individuals of different population subgroups and generations. Although contributions and benefit features and levels, including eligibility ages, will inevitably be tweaked in the future, relevant actuarial projections can facilitate objective public discussions of what constitutes desirable and affordable retirement programs that are as fair as practical between generations and population subgroups, at the same time as providing adequate protection in a sustainable manner.

Change is difficult because people have an expectation that the current eligibility age will remain constant. Therefore, long transition periods are desirable. Nevertheless, deferring change can lead to financial unsustainability, to the detriment of all.

Chapter 4: Retirement policy strategies

4.1. Introduction

In this chapter we discuss various policy decisions and incentives that can be used to modify retirement patterns of participants in a retirement income system, including those involving the eligibility age. It begins by discussing an example of an important public policy decision – the relative eligibility age by gender. Actuaries can help in the assessment of the various discussed strategies related to retirement.

4.2. Eligibility age by gender

Sudden or gradual changes in policy and societal attitudes can affect the entire population or specific population subgroups. A good historical example is the increase in labour force participation rates for females, which has occurred at different speeds by country. Chart 4.1 illustrates the evolution of labour force participation rates for females in the United States. At the beginning of the 20th century married females were often limited to home-care, thus not expected to participate in the labour force. As society increasingly accepted the right and benefits of having females work, more entered the full-time labour market. Today, female labour force participation is similar to that of males in many OECD countries, with movement towards this pattern in many developing countries as well.

Attitudes toward females, in part due to labour participation patterns and generally a larger role in caring for older dependents, led to younger eligibility ages for females in many countries. Changes in labour patterns, among other demographic and social changes, have resulted in the establishment of retirement policies that take into account female working patterns and earnings potential. In particular, in 2012, 20 out of 34 OECD countries had the same eligibility age for males than for females in their social security programs (OECD (2013)). However, as a result of planned reforms, in the future only Israel and Switzerland will have different eligibility ages by gender. This convergence trend is not as pronounced in other parts of the world (for example in Asia, as demonstrated by a comparison of Charts 1.1A and 1.1B), since the gap is impacted greatly by cultural traditions and expectations. However, possible evolution of labour market policies, in combination with the increasing financial stress on sustainability of retirement programs, may continue to result in cultural and policy changes with respect to relative eligibility ages for females.

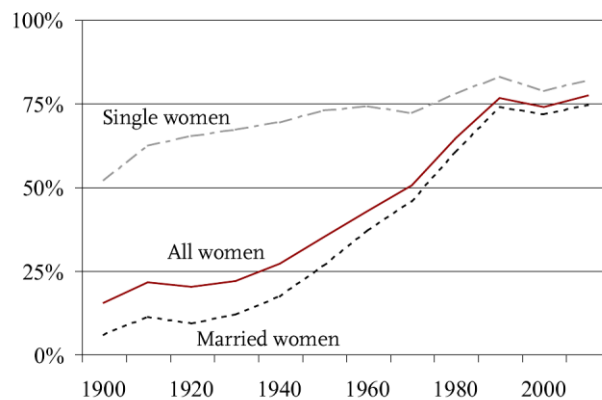


Chart 4.1 Labour Force Participation Rates (United States) of Females

source: Munnell (2012)

Setting the eligibility age for females depends on a multitude of factors. While on average they live longer than males, they also spend a lower percentage of their life in good health. Based on Eurostat data, in the EU27 the average difference in life expectancy at age 65 between males and females is 3.6 years, while the difference in healthy life years is only 0.2. This means that many females spend more years with some activity limitations. Females are also more likely than males to be affected by multiple morbidities at older ages. This suggests that on average they will spend more resources on medical care and other forms of assistance.

This difference in health status of older females is often accompanied by lower retirement income. This is a result of lower relative earnings, breaks in career due to maternity and more time off for caring for family members, as well as more underemployment in years leading up to retirement.

An increase in eligibility age for females can provide an increased opportunity to accumulate greater retirement income through more years of credited work. However, if such an increase is not accompanied by relevant labour market changes that enable them to continue work or increase benefits due to a later retirement age, it may instead lead to an increased level of poverty among older females. The risk of creating poverty by increasing the eligibility age for females may also be mitigated by social welfare programs. Chapter 5 provides further discussion of the effects of an increase in eligibility age for females as alternatives in the case of Israel.

4.3. Strategies that can be used to modify retirement patterns

A major challenge for each retirement arrangement is the possible imbalance between funding and the promised or desired benefits to participants and their beneficiaries. For pay-as-you-go social security programs, this can take the form of a shortfall of current contributions in relation to current promised benefits over a long-term horizon. For employer-sponsored pension plans, it might be an imbalance between accumulated assets and the value of the obligations to pay pension benefits throughout the life of the retirees and their beneficiaries. For individual savings (including DC plans), it is the imbalance between accumulated assets and the desired level of benefits.

This imbalance is an ongoing concern for many retirement arrangements. An effective design results in a balanced plan or possibly a positive balance under reasonable assumptions. Alternatively, the design can provide for a shortfall at the front-end, expected to be recovered over time. Either way, whether a balance between current assets and the expected future net cash flows exists, imbalances may develop over time or be expected to arise in the future as a result of changes in the demographic aspects of the plan or in economic conditions, such as increased longevity, reduced fertility, lower investment yield and labour market conditions. Adaptations can be made by means of rebalancing policies that may affect retirement behaviour, like the ones listed below. Box 1 provides an example of what could happen if no timely actions are taken.

Increasing the eligibility age

An increase in the eligibility age extends the contribution period and reduces the expected benefit payment period, as commonly applied by social security programs. As indicated above, many countries have or are in the process of increasing the eligibility age for their social security programs, e.g., from 65 to 67 with future projected increases to 70 or even higher, often in response to increased life expectancy and where future generations are considered, in response to decreased fertility.

Employer-sponsored DB plans tend to use this strategy in conjunction with social security eligibility changes, but due to political realities they rarely increase the eligibility age if there is no change in the social security program eligibility age,

Such a change is usually carried out gradually over several years (e.g., increase of the eligibility age by four months each year over six years – for a total increase of 2 years). According to the OECD (2013), nineteen OECD countries already have or are scheduled to have the eligibility age for males set at age 67 or older. For females, the number of countries is eighteen, with only Israel keeping the eligibility age for females below age 65, as described in Chapter 5. A summary of European increases in eligibility age can be found in European Commission (2015).

Box 1: What happens when sustainability and affordability of DB retirement schemes are ignored – example from Israel

The Israeli union-based pension funds were implemented in the mid-1950s. The design of the seven funds emphasized maintenance of the standard of living of the eventual retirees, usually promising a benefit of 40% (after 10 years of membership) to 70% (after 35 years) of the final salary or average of the final three years' salaries, with pension indexed to further salary increases, and eligibility age of 65 for males and, for social reasons, of 60 for females. Contributions to the funds were based on the government tax policy, which for many years were 10% of salary, divided equally between employer and employee. This level of contributions was insufficient to provide the promised benefits. However, since the plans were immature, with only minimal benefit payments, significant pension assets were accumulated and an adverse actuarial balance was ignored. Generous benefits with low contributions allowed these plans to be used as a powerful recruitment tool. Further, these pension plans played an important political role by supporting new immigrants to Israel with generous pensions.

The design of the plans assumed that all future generations of the unions' members would join the plans, thus assuring an inter-generation subsidization of the current generation. However, continued reliance on outdated 1948 mortality tables and inappropriate investment policy (the majority of assets were invested in government and union bonds), together with high administrative costs, aggravated sustainability problems. While actuarial warnings regarding the sustainability of the funds were pronounced from the early sixties, nothing was done for several decades to balance the funds, offset the increase in longevity, or the decrease in investment yields.

The first set of reforms occurred in the 1980s – the very generous 10-year pension was replaced with a 2% annual accrual of benefits, the linkage of final salaries to the average salary over the total membership, increased pension for delayed retirement, and higher contribution rates. In 1991 the actuarial basis was updated to current mortality tables, and the actuarial methodology was changed to a closed group approach (only current plans participants were considered). In 1995 the union retirement plans were nationalized, and were closed to new members.

Since then the benefits have decreased. Participants had to pay a management fee on pensions, salaries and salary growth were capped, contributions were raised to 20.5%, future benefits to participants were cut, and eligibility age was raised for both males and females. The mortality assumptions were updated, and now include annual adjustments for increased longevity. Further, the funds were merged and their benefits and terms were unified.

Plan participants were not the only losers – the public lost as well. The government subsidized the plans heavily and, essentially, every citizen in Israel was required to pay for retirement and disability benefits to the hundreds of thousands of union plan participants.

Indexing the eligibility age

Several countries (e.g., Denmark, the U.K. and the Netherlands) have adopted or are proposing to adopt the policy of indexing the eligibility age for their social security program in a manner consistent with changes in longevity. For example, in Denmark, based on reforms in 2006 and 2011, early retirement is restricted in terms of duration, accessibility and benefit generosity, and the eligibility age will increase

from 65 to 67. This process will be completed by 2024. After 2024 the eligibility age will be indexed to longevity. The aim is to keep the duration of the average old-age retirement period stable at around 17 years. The minimum eligibility age in employer-sponsored pension plans will change in line with the statutory eligibility age and remain five years younger. The legislation stipulates that increases will be announced with at least fifteen years' notice and that planned increases will be confirmed by parliament. Chapter 5 discusses the pros and cons of this approach.

The policy of increasing the eligibility age in line with increases in longevity requires making assumptions about future mortality improvement rates if cohort expectations are used. As discussed in Chapter 2, the use of balanced and realistic mortality assumptions is one of the main factors contributing to the success of such policies.

Sustainability factors

Another approach to achieve a similar objective has been adopted by Finland and Spain. The eligibility age remains the same, but the pension benefit payable at the eligibility age is adjusted by applying a sustainability factor, defined as the proportionate reduction in pension due to increased expectation of life at the eligibility age. Thus, individuals can still receive a pension at the same eligibility age but the amount is reduced to reflect the longer expected period over which it will be paid. Alternatively, individuals can choose to retire later and receive an unreduced benefit.

Notional Defined Contribution

In 1994 Sweden pioneered a switch from a defined benefit social security program to Notional Defined Contributions (NDC, sometimes also referred to as a non-financial defined contribution plan). Similar programs have been introduced in Italy, Latvia, Poland and Norway. Benefit entitlements for each individual accrue as an accumulation of employee and employer contributions, increased by a specified index, such as wage growth or GDP. The accumulated lump sum is then converted to an annuity at the age when benefits are taken by dividing the lump sum by the applicable annuity value. The annuity value at a particular age of retirement can be increased to reflect the latest projection of longevity, thus passing on the longevity risk to the participants. Individuals are thus incentivised to take their pension later, as they will accumulate larger benefits and will have a lower annuity factor, both contributing to a higher rate of benefit payment in retirement.

Increasing early retirement penalties and rewards for delayed retirement

As discussed in Chapter 1, for programs that offer a range of possible retirement ages, the benefits are decreased for early retirement and increased for late retirements. If reduction factors are perceived to be at a level that favours early take-up of benefits, high utilisation of early retirement is likely. Since these reduction factors are often determined on an actuarially neutral basis from the point of view of the overall pension program, there will be always population subgroups and individuals who are either advantaged or disadvantaged by these adjustments.

Even with factors that are actuarially neutral or even penalize early retirement, individual perceptions may be that early benefit commencement is more advantageous. This perception could be triggered by factors including (1) insufficient financial literacy, (2) lack of confidence in the ability of the program to pay future benefits, (3) underestimation of one's life expectancy and (4) individual circumstances such as poor health. In this regard, proper communication with and education of the program's contributors and beneficiaries is vital.

Similarly, incentives to retire later can be provided through greater benefits for post-eligibility age work than for pre-eligibility age work. This could be done, for example, through increasing the accrual rate or increasing the annual post-eligibility benefit by some percentage.

To design incentives to delay retirement is not easy, since this personal decision is often largely based on perceptions and personal behaviour, as well as consequential changes due to these incentives. Often this is an iterative process for a plan, where the effectiveness of such designs is monitored as the actual experience becomes available, and incentives are modified as needed.

Strengthening eligibility requirements for retirement benefits

One example of strengthening eligibility requirements is to increase the length of the contribution period needed to become eligible for a pension, as was done in France where the required contribution period is further expected to be linked to life expectancy. A related strategy is to require a minimal participation period in the plan that excludes some periods of low earnings.

Providing an eligibility age that differs by population subgroups

As an example of eligibility age that differs by population subgroup, females and workers in risky or strenuous occupations, e.g., such as firemen, policemen, soldiers or miners, may have a lower eligibility age than the rest of the population. While this difference may respond to specific needs of those in some groups (it can also serve as a policy tool aimed at attracting people to risky or strenuous occupations), such differentiation is not always effective or desirable, since it may in certain cases lead to “double dipping”.

An alternative approach includes providing for transitions of such people to alternative occupation. For example, a municipality could plan for training and transferring firemen and policemen to less demanding jobs as they age.

Combining work and retirement

Some countries enable people to work after their eligibility age, while simultaneously receiving their “normal” pension and possibly accruing additional benefits. Without such an incentive, there may be a limit to total pension plus work income, so that as the work income increases the pension is reduced. An example of such approach used in Canada was discussed in Chapter 1.

Encouraging higher pension savings

Regulatory action can enable pension contributions to grow faster than other investments, e.g., through preferential tax treatment of contributions or of investment yield, preferential tax benefits for monies contributed in excess of “normal” contributions (usually with an annual limit) directed to pension savings or by limiting management fees for contributions and assets. This type of policy may help provide income during the period between early voluntary or involuntary exit from the labour market and the age of eligibility for other types of retirement income.

Subsidizing certain population subgroups

The goal of this subsidy is to enable low-income workers to receive relatively higher benefits for each unit of contribution than higher-income workers. The underlying philosophy for this strategy is that those with higher incomes should have other assets and retirement income sources, thus requiring less

support from the employer-sponsored pension plan or the social security program. Examples include (1) reduced tax benefits for contributions from those with higher income, (2) a higher benefit as a percentage of income for those with lower income, (3) a flat-rate benefit independent of earnings, but financed from earnings-related contributions or progressive income tax, and (4) reduced or limited pensions for retirees with high non-pension income. Similarly, workers and retirees below or close to the poverty level who cannot benefit from preferential tax treatment as they do not pay income tax, may receive a contribution or pension subsidy directly from the social security program or other government agency.

Linking eligibility age for pension with eligibility age for other benefits

Another approach is to link the eligibility age for one's pension to the age at which the person is entitled to other benefits, such as for health care. In the United States, for example, those reaching age 65 are entitled to Medicare (a program for health benefits for those aged 65 and older) benefits. Thus, people are discouraged from retiring at a younger age (they can retire at age 62 and receive less than actuarial neutral social security pension benefits), as they will have no employer and no Medicare health coverage during the years from retirement prior to age 65, although benefits are available for three years after termination from work from benefits based on the Consolidated Omnibus Budget Reconciliation Act (COBRA), which provides for a continuation of benefits after employment termination at relatively expensive rates or from a health insurance exchange based on the Affordable Care Act.

Harmonising the eligibility age of employer-sponsored pension plans with social security programs

Harmonising retirement provisions of employer-sponsored pension plans with the social security eligibility age could help to retain older workers in the labour force. As discussed in Chapter 1 in the example of the Netherlands, a country could use tax-based tools to influence the provisions of employer-sponsored pension plans. However, the key for success is the willingness of social partners (government, employers and employees) to address the problem.

Increasing labour force participation and employment rate of older workers

Major determinants of the eligibility age, as well as the age at which retirement occurs, include the desired participation of workers in the labour force and employment availability for older age workers. This participation reflects the ability, needs and willingness of people to work, as well as the experience of older workers. Several strategies discussed in this chapter could contribute to higher labour force participation rate of older workers and thus their lower reliance on retirement income. Nevertheless, the labour force participation rate depends on the availability of suitable work and on the willingness of employers to keep or hire older workers and to adapt employment conditions to their specific needs.

Many countries have introduced legislation that forbids discrimination based on age, gender or ethnicity. However, this is not enough. The state needs to encourage employers to continue employing older workers. It may be done, for example, by providing employers with tax benefits related to the remuneration of older workers or contributions for these people.

Increasing confidence in the future of retirement programs

If plan participants have confidence in the ability of a retirement program to guarantee their future benefits, they are less likely to opt out for early (even reduced) benefits. Good governance, regular monitoring of financial sustainability and appropriate communication increase the confidence of plan members and enable them to delay retirement with less worries about their future. One approach to discourage early retirement is to lock-in specified pension benefits – this may enable some participants to reduce their worries about their financial future. One example where this was done was public pension plans in the State of Illinois in the United States, where the State constitutionally guaranteed that these pension benefits cannot be reduced.

Other strategies

Other strategies, such as maintaining the buying power of retirees through linkage mechanisms, have less impact on the eligibility age and facilitate postponement of retirement. Further, the policies listed below are aimed at strengthening the sustainability of pension programs, the provision of adequate benefits and public support of the programs. If such policies are successful, an increase in the eligibility age may become less necessary. They all involve increasing contributions or investment income or reducing benefits. Examples include the following:

- **Increasing contributions.** This can be accomplished by use of a broader definition of covered workers' income from which contributions are paid, by increased contribution rates or by linking the contribution rates and limits to an economic or demographic variable (such as cost of living adjustments). Additional sources of contributions might be tapped, although affordability concerns will likely occur in any case.
- **Enhancing investment yield.** This strategy promises a specific yield rate for part or all the accumulated assets, e.g., the government could provide the program or plan with government securities at that rate. In Israel, for example, union pension plans were required for many years to invest 70% of their assets in government bonds issued at an annual rate of 5.5%; this rate has recently been reduced to 3.0%. While this strategy removes some of the financial uncertainty of the plan, it is particularly important in periods when market yield rates are low. In such periods, the assured rate represents a subsidy by the government and taxpayers to pension savings.
- **Reducing investment risk through life-cycle asset allocation.** This regulatory action requires pension plans to provide several investment options, with the accounts of people nearing retirement being channelled to lower-risk investments. In using this strategy, pension participants younger than age 50 are allowed to select any of the available investment options (e.g., securities-oriented or bond-oriented), while those older than age 50 are required to direct a certain percentage of their accounts to lower-risk options, with the percentage increasing the nearer they are to retirement. The rationale supporting this strategy is that the longer the time until retirement, the more risks the worker can assume as he / she will have sufficient years to overcome most losses incurred. However, particularly given current low interest rates in most countries and given that retirement is often expected to last twenty years or more, this strategy can be questioned.
- **Changes in other benefit features.** There are many possible changes in program features that can mitigate program or plan solvency concerns. Restricted eligibility, such as requiring a larger number of working years, and current or future benefit reductions, including partial means-testing, changing benefit formula and reduction in cost-of-living adjustments.

Communication strategies

Clear and timely communication of changes and potential changes can be quite important for stakeholders and the public. In deliberating changes, decision-makers and actuaries need to consider the communication aspects of a change. For example, an increase in the eligibility age can be presented as either (1) a benefit reduction, (2) maintaining the responsiveness of the program to increasing longevity and later work initiation as youths or (3) beneficial encouragement to enable continuation and reward of work through older ages.

Governance considerations

Depending on the legislative and governance environments in which a program operates, change in the eligibility age may require agreement between various stakeholders, and may be not easy to implement. For example, for social security programs, it is quite common that changes need to be approved by the relevant government body. It may become even more complicated. For example, in Canada, the Canada Pension Plan (an earnings-related social security program) is jointly governed by ten Canadian provinces – any change requires an agreement of two-thirds of the provinces representing at least two-thirds of the Canadian population. For employer-sponsored plans, in addition to the employer, other stakeholders involved may include trade unions, active members' organizations and pensioners' organizations.

The key for making changes is the willingness of the primary stakeholders to cooperate. Actuaries can add value by being involved in the education of the stakeholders by explaining the needs and effects of changes, identifying winners and losers, impacts on other programs, as well as providing quantitative analysis of alternative options and strategies.

4.4. Summary

Increasing the eligibility age is one possible response to a retirement income system coming under financial pressure. At the same time, it also may be desirable to adopt supplementary actions to address the adverse effects of such a change on different population subgroups or to adopt an alternative approach incorporating some combination of benefit decreases and contribution increases to address sustainability concerns.

This chapter sets forth a range of other possible strategies that respond to this financial pressure. These approaches include: increasing early retirement penalties and rewards for delayed retirement, strengthening eligibility requirements for retirement benefits, varying the eligibility age by population subgroup, encouraging or incentivizing workers to remain longer in the labour force, encouraging more individual and corporate-sponsored pension savings, subsidising certain population subgroups with special needs, linking the eligibility for pension benefits to the eligibility age for other benefits and harmonising the eligibility age of employer-sponsored pension plans with social security programs.

Chapter 5: Effects of alternative eligibility ages

5.1. Introduction

In this chapter we analyze the effects, both positive and adverse, of alternative eligibility ages on employer-sponsored pension plans and their participants and on social security retirement programs, the productivity and growth of the economy, job and labour markets, and society at large.

In the rush to achieve enhanced fiscal sustainability, there can be a single-minded focus on raising the eligibility age. This report does not indicate that this approach is bad, but rather that its consequences need to be understood and appropriate actions are needed to offset its adverse consequences while taking advantage of positive effects. For instance, a sizable portion of the population is not able to work at older ages even though their financial needs may be similar to other retirees, while many others are able and willing to continue to work to older ages, even though it may be in a different form.

The discussion will refer to a single employer-sponsored plan or social security program, while recognizing that each may include several plans (e.g., separate plans for males and females, union and non-union, and a separate plan for the disabled), each with its own eligibility age and other design features.

5.2. Employer-sponsored pension plans

One of the pillars of retirement income in many countries is employer-sponsored pension plans. This section considers the effects of increasing the eligibility age of an employer-sponsored pension plan. Although the actual age at which people retire and the method used for the transition to retirement are driven by a range of factors (see the Introduction and Chapter 1 for a discussion of the process of retiring), the employer-sponsored pension plan's eligibility age can be expected to be perceived as the expected or normal age for retirement, at least for the participants in the plan. Nevertheless, there is a tendency for employer-sponsored pension plans' eligibility ages to cluster around the eligibility age for the social security program in the applicable jurisdiction.

In the following discussion it is assumed that the plan has a declared eligibility age and allows for early or delayed retirement. In addition, the plan sponsor may consider changing this eligibility age. The discussion assumes that there is no legal limitation to the choice of the eligibility age.

5.2.1. Affordability / adequacy of pension benefits

The increase in eligibility age for employer-sponsored pension plans is mostly a result of concerns relating to affordability and sustainability. Many current pension plans in developed countries were established many years ago; the original mortality / longevity assumptions, as well as other assumptions, including financial, salaries and membership, are often not currently appropriate for these plans.

Traditionally, DB plans were the dominant form of employer-sponsored plans. They promised a retirement income based on years of work and (usually related to final) salary. These were obligations of the plan sponsor, usually the employer or as agreed in a union-employer contract. The plan sponsor took on the investment, inflation and the demographic (particularly mortality) risks. As time passed, life expectancy lengthened, investment yields declined and participants aged, the

liability of these DB plans increased. To remain solvent, plan sponsors decreased their liabilities by reducing benefits or increasing contributions. Alternatively, they could increase the eligibility age, which added an additional period during which contributions could be made, a longer period to earn investment income and a reduced period over which benefits would be payable – three factors that increase the solvency and stability of a DB plan. Offsetting the effect of this change somewhat is the necessity of keeping on the usually higher paid older age staff.

Currently, DC plans⁸ have become the preferred vehicle of employer-sponsored pension plans in many countries, rather than DB plans. DC designs provide stable and predictable costs to plan sponsors, remove membership distribution risk and transfer pension plan sustainability concerns from the employer to the plan participants, for both pre- and post-retirement periods. The DC design usually makes the choice of eligibility age the worker's choice rather than a decision that the plan sponsor makes, and provides the individual with the same three benefits noted above for delayed retirement – an additional contribution period, an additional period to earn investment income and a shortened pension payout period. At the same time, it frees the employer, absent government rules, to make employment decisions independent of pension plan-related issues.

The combination of additional contributions and additional investment income to a DC plan means that for a given period of additional longevity, a DC plan participant may not need to work for the entire period of this additional expected longevity – a lesser period will usually suffice to maintain the same post-retirement benefits. This also applies to DB plans, provided the plan sponsor makes the necessary adjustment to the benefit accrual rates.

Nevertheless, even with delayed retirement, risk remains for DC (and private savings) plans – how can the participants ensure that the accumulated savings will last for their lifetime. If the retirees manage the assets and withdraw funds for their ongoing consumption, they continue to carry the investment and longevity risks. However, if the plan converts these accumulations into an annuity based on some conversion factor, these risks are transferred to the supplier of the annuity.

Unless retirement is mandatory at the eligibility age, the actual retirement age and the selection of early or delayed retirement is the decision of the plan participant, with the consent of the employer. Considerations affecting the actual retirement age are more or less the same as discussed in Chapter 1 and include, for example:

- Other retirement income available to the worker, either from other savings, social security benefits, post-retirement part-time or full-time work;
- Availability of employment;
- The need of the individual in a DC plan to carry the investment and longevity risks prior to and following retirement, as explained above;
- The health of the participant and other family members;
- Cultural and societal practices;
- Expected future lifetime;
- The support the retiree expects to receive from relatives or the community, particularly important for unhealthy retirees; and
- Activities that can fill one's retirement time, such as hobbies or volunteer work.

⁸ Personal pension savings accounts, like the Individual Retirement Accounts (IRA) in the United States., have the same characteristics as employer-sponsored DC plans, with one difference. In DC plans – in contrast to personal pension savings – the level of contribution, either by the employee or the employer, is often determined by the plan, in which case it cannot be changed at will by the employee, ensuring a consistent contribution inflow into the pension savings accumulation.

A major factor in making the retirement decision is the advice and retirement planning support available to the individual. Without sufficient support, individuals may act with insufficient knowledge. As a result, some people will eventually end up with inadequate pensions (either due to high early retirement reductions in DB plans, underestimation of future mortality or longevity improvement, reduction in investment income and ultimately an insufficient account, as well as pitfalls of decumulation in DC plans) and will rely more heavily on income-tested social security or social welfare (safety-net) benefits, thus increasing the overall cost of these programs. In this way, the burden and volatility of the cost of retirement is shifted from plan sponsors to individuals and to society.

Government-provided social welfare benefits are almost always funded on a pay-as-you-go basis with no pre-funding. Thus, it could be expected that if more retirees receive these benefits, unintended inter-generational transfers and equity issues may arise.

In summary, increasing the eligibility age of an employer-sponsored pension plan is not a “silver bullet” that solves all problems. Other things being equal, however, it does increase the affordability of DB plans and increase participants’ retirement benefits in DC plans.

5.2.2. Adequacy of death and disability benefits

In a DB pension plan, the predominant death benefit is a reversionary pension to the surviving spouse (income payable to the widow / widower of a plan participant) / orphans. This benefit for survivors of active workers is often in the form of a fixed percentage (e.g., 60%) of the pension that would have been payable if the participant had continued working to the plan’s eligibility age, while for survivors of retirees it usually is in the form of a fixed percentage of the actual pension. In the event of an increase in the eligibility age, the death benefit would remain unaltered in form, but the pension on which it would be based may increase due to more working years or may decrease if the worker chooses the same retirement age as did prior cohorts. If the increase in eligibility age is due to increases in longevity, the cost increases further by the additional period of the spouses’ pensions, although it will somewhat decrease due to the shorter retirement period. In most cases overall, these changes usually would not be significant.

In a DB pension plan the disability benefit is often the pension that the participant would have received if he / she had continued in employment to the plan’s eligibility age. Assuming that this design continues, the cost of this disability benefit increases because of the increase in rates of disability at older ages, the extended coverage period, and the resultant increase in the expected pension due to additional working years. The plan sponsor would need to reflect this increase in costs when considering the overall level of benefits.

In a DC plan, the death and disability benefits for an active participant are typically restricted to that person’s account balance plus an insurance benefit, which may be a fixed amount, an amount based on working years, or an estimate of future contributions payable through the plan’s eligibility age. This design could be retained if there is an increase in the plan’s eligibility age, with the additional challenge of obtaining an affordable disability cover at the higher ages. A practical outcome, in both DB and DC plans, is to make the definition of disability more restrictive at higher ages.

5.2.3. Consequences of a move to part-time employment

One of the themes of this report is a trend toward later retirement, often accompanied by more flexible working arrangements throughout life – such as breaks in employment, part-time employment and phased retirement.

DB plans can cope with such changes in a single employer plan by retaining the concept of “full-time salary”. For example, if a participant works for half a year and earns \$40,000, an accrual of half a year towards his / her benefit entitlement is made, with the full-time equivalent salary remains at \$80,000. Also, older workers can be protected from the adverse effect of declining salaries at higher ages by using years of their highest salary as a base for determining benefits. These measures, however, increase the complexity of DB pension plans, with the situation even more complex where employees move from one employer to another.

In contrast, DC plans can readily cope with changes in working patterns. Cessation or reduction of contributions does not affect the mechanics of DC plans, as account balances continue to increase with whatever contributions are made, plus investment income. To simplify retirement planning and reduce administrative complexity and cost, it is desirable for participants to retain a single pension account, even as they move from one employer to another, provided benefit portability is available.

The main disadvantage of DC plans during periods of unemployment (or reduced employment) is that the eventual retirement benefit can be eroded by insurance premiums and administration expenses, since there is no longer contribution inflow to offset these costs.

5.2.4. Early access to employer-sponsored pension savings

If the eligibility age for employer-sponsored pension plans is increased, then more care is required in respect of the rules pertaining to early access to benefits as is briefly discussed in Chapter 3.

On the one hand, benefits prior to the eligibility age should be restricted so that the benefits upon retirement are not diluted. On the other hand, some individuals will be fortunate enough to have accumulated sufficient wealth to be able to retire before the plan’s eligibility age and should be allowed access to their funds, although the determination of what is “sufficient wealth” may be subjective. Others may require access to their savings because of financial hardship. However, based on experience with 401(k) plans in the United States, extensive use of plan “loans” can appreciably reduce the amount in the plans for use for retirement purposes, thus contributing to financial hardships at older ages and / or the need to place greater reliance on social security or social welfare benefits.

Thus, early withdrawals need to be considered with caution, with appropriate safeguards to ensure that withdrawals occur only when the financial hardship is real. Plan rules (and legislative restrictions) will need to be designed to balance these competing requirements.

A more radical proposal (Wickham (2013)) allows withdrawals for a wider range of purposes, including to:

- pay for approved medical expenses;
- pay for education / retraining expenses;
- purchase an immediate annuity; or

- withdrawal of a general nature in the form of monthly income.

Although this proposal would assist people manage their work, leisure, and caring time throughout their lifetime, it also increases the likelihood of poverty in old age and consequential need for public support.

5.2.5. Incentives to delay retirement

Deviations from actuarial neutrality of benefits by age can provide incentives for early or later retirement. If benefits cease to accrue with increasing service, DB pension plans provide participants with an incentive to retire early at that point, since the actuarial value of a set level of pension decreases with increasing age.

Delayed retirement is encouraged by some DB plans by the application of an actuarial adjustment to benefits on later retirement, or additional accruals and corresponding increased benefits. Examples are provided in Chapter 1 for the Netherlands and for Denmark. In some cases though, tax regulations impose limits on DB benefits that are aimed at limiting deductibility of employer contributions and the amount of employee benefits. Due to the importance of tax regulations that vary by country, this issue will not be discussed further here.

DC plans provide an incentive for participants to retire later, assuming that their health and employment status permits. As previously mentioned each additional year of participation:

- Adds a year of contribution;
- Adds a year of investment return; and
- Reduces the period over which the balance must last by nearly a year.

5.2.6. Investment considerations

If the eligibility age in employer-sponsored pension plans is increased, then *ceteris paribus*, if there is a positive investment return greater than the growth in plan benefits payable, the level of assets in these plans will increase. This could raise the issue of whether the aggregate amount saved will be too large to be absorbed by capital markets. For example, in Australia, the level of assets held by pension plans exceeds 100% of GDP and the value of all equity shares listed on the stock exchange.

However, according to the Productivity Commission (2013), the very conditions posited in this report may offset this potential threat. An ageing population and a further shift to service industries are likely to lead to lower labour productivity growth in the future. Further, the move to an information-based society leads to increased overall productivity at the cost of labour productivity. Thus, to maintain an overall acceptable increase in productivity, there needs to be an increase in the capital to labour ratio. The Productivity Commission (2013) estimated that aggregate fixed capital spending required in Australia to underpin capital deepening will be about \$38 trillion over the next 50 years, which is around five times - in real terms - the sum of investments required over the previous 50 years.

5.3. Social security

The considerations described above for deciding whether to raise the eligibility age for employer-sponsored pension plans do not necessarily apply to social security programs. Since one objective of social security programs is to provide a basic safety net for those who retire, these programs need to provide an adequate benefit for subsistence purposes.

Employers, in contrast, place greater emphasis on affordability and sustainability. They have been likely to attempt to reduce contributions or benefits (especially in service and information industries) with the expectation that social security programs will provide for a minimum necessary benefit amount. An example of this emphasis in many countries has been the shift from DB to DC pension plans where employers transfer investment and longevity risks to employees with an understanding that where individuals outlive their retirement savings, social security and social welfare programs will provide at least the needed minimum benefit.

Partly because of this different perspective, the decision to increase the eligibility age for social security programs should be based on a more holistic approach. In the search for solutions to restore or to enhance the sustainability (either financial, inter-subgroup or inter-generational) of social security programs, the “social” nature of these programs should not be forgotten.

Some of the policy issues that need to be addressed are discussed below. While these are presented as separate issues, they are interrelated. In any case, the basis for decisions should explicitly consider a comprehensive assessment, based upon a long-term actuarial horizon rather than solely on a short-term political or financial perspective, including rigorously developed unbiased benefit/cost projections and scenarios that consider long-range cost implications.

First, are benefits at an adequate level? Depending on the design and objectives of the social security program, adequacy can be assessed either in terms of an absolute amount (i.e., poverty alleviation) or as a proportion of pre-retirement earnings. If the former, the level of adequacy can be assessed using the metric of *relative expected benefits* (see box 2), and if the latter, it can be by use of the *replacement ratio* metric (see box 2).

Analysis of these metrics should be performed for individuals with different levels of income, as well as different career paths (e.g., reflecting part-time work, time off the labour market for maternity and periods of unemployment). This analysis, while concentrating on social security programs, should take into account other possible sources of income. The analysis should also assess how benefits will evolve. The greater the adequacy of current and future benefits, the less is the need to raise the eligibility age. In other words, if the social security program is under financial stress, but benefits are assessed as being more than adequate, then it may be desirable to reduce the level of benefits, although that will also be a result of raising the eligibility age.

Second, are contributions at a level that is not sustainable or too low in relation to the current and projected fiscal burden generated from the program? This is especially important since retirement is expensive – for example, European Commission (2015) shows that public spending on pensions in 2013 was the highest component of total age-related expenditures. Metrics used to measure sustainability of contributions and the fiscal position include *old-age dependency ratio*, *money's worth comparison*, *ratio of benefits to contributions* and *affordability of contributions to average wages* (see box 2). If contributions are now regarded as affordable, increasing contributions might be considered rather than increasing the eligibility age.

Box 2: Metrics commonly used to assess the affordability of contributions and adequacy of benefits for social security analysis include:

- **Old-age dependency ratio** – the ratio of the number of old-age beneficiaries of the program to those who contribute to the program. This indicates, especially for programs funded on close to a pay-as-you-go basis, the necessary contribution rate, and thus the overall sustainability of the program.
- **Ratio of benefits to contributions** – the ratio of total benefits paid by the program to contributions received by the program. It can be calculated on either an undiscounted or present value basis. If the program is supported by other than wage-related sources (e.g., general government revenues, including subsidies), various ways are possible to incorporate these other sources of revenue.
- **Replacement ratio** – the ratio of the benefits provided by the program to prior earnings (possibly taxable wages). Because of the progressive nature and wage related benefits of many programs, this ratio should be assessed in several ways at several historic wage histories, e.g., at different quintiles of earnings, at the individual and household level, including and excluding additional resources, before and after taxes, and at alternative retirement ages (e.g., early, full and late). Although often used reflecting the entire population, it is far more revealing when calculated on population subgroups.
- **Money’s worth comparison** – the expected rate of return to an individual of that person’s expected benefits to the corresponding expected contributions by that person. This can be assessed by determining the implied rate of return (either from that person’s contributions or including other contributions made on behalf of that person, e.g., from employer contributions) or a comparison of present values given a chosen rate of return. This can be based on real or hypothetical beneficiaries, possibly using alternative wage histories. Caution may be needed for comparison purposes, as to whether calculations use the same mortality expectation for all or that reflecting the circumstances of each subgroup, and whether current or projected mortality rates are used. The rate of return for a given cohort can also be used.
- **Relative expected benefits** – level of benefits relative to expected cost of living in retirement for individuals in different generations or population subgroups.
- **Affordability of contributions to average wages** – this ratio comparison can be made between generations.

5.4. Ripple Effects

Changes in the eligibility age for retirement programs can have unexpected consequences. For instance, how will the increase in the eligibility age for social security programs affect employer-sponsored plans or other social security programs such as those providing benefits for periods of disability or unemployment? How will the increase in the eligibility age for employer-sponsored plans affect labour markets and economic growth? Although raising the eligibility age without changing the corresponding

full benefits will lead to a reduction in old-age social security costs, it can also lead to cost increases of related provisions such as unemployment, social welfare and disability benefits.

As with any reform, an increase in eligibility age, even when based on the increase in average life expectancy, generates winners and losers. Among the losers will be people with worse than average health and those at lower levels of income, as well as population subgroups employed in certain occupations. This concern is because on average, those in lower socio-economic groups experience higher rates of mortality, and the gap between rates of mortality of the highest and lowest socio-economic groups in many countries is widening. (Refer to the [IAA Mortality Working Group – Information Base – Social and demographic stratification](#)).

Those in the higher socio-economic population groups tend to have greater personal savings, participate in employer-sponsored pension plans, be able to work longer and achieve a longer life expectancy. Conversely, the lowest socio-economic population tend to be less able to work to a higher eligibility age, yet have the greatest need for social security support and have lower expected longevity. As a result, relatively speaking, raising the eligibility age can disadvantage the lowest socio-economic population segments. Effective early retirement or income support programs and increased acceptance of phased retirement may be needed.

An increase in social security eligibility age may necessitate the development of mitigation strategies that will incur additional costs that offset some of the savings of the increased age. In particular, it may adversely affect the cost of social welfare programs and disability provisions that may become a de facto transitional early retirement program for many. For example, in 2009 in Norway, at age 67, about 40% of new old-age pensioners were former disability pensioners (Holzmann et. al. (2012)). Thus, the analysis of the complementarity of various programs is crucial in order to avoid unintended behavioural consequences.

Further research is needed regarding the relationship between total longevity and healthy longevity by population subgroup. As an example, if total longevity increases by, say, five years, but healthy longevity increases by three years, then it may be counter-productive to raise the eligibility age by five years. (For further information on healthy longevity refer to the [IAA Mortality Working Group – Information Base – Healthy longevity](#))

As discussed earlier in this report, some countries directly link the eligibility age of social security programs to increases in longevity. This automatic eligibility age indexation can provide a safety net for a program's sustainability, as well as reduce political risk related to the desire of politicians to avoid making unpopular decisions. Nevertheless, this eligibility age indexation does not completely remove political responsibility. A recurring issue is to confirm whether the basis for longevity indexation remains actuarially reasonable. The application of automatic indexation implies that increases in the eligibility age are not necessarily preceded by the careful consideration of all the issues raised in this report, including the appropriate treatment of those with the greatest need for social security and social welfare support, who are the ones with the least ability to work to the higher eligibility age. The impact on disability, social welfare and unemployment programs, as well as the availability of employer-sponsored pension plan benefits, may reduce the need for a one-to-one correspondence between the period of increase in longevity and increase in the eligibility age.

The method by which an increase in the eligibility age is applied is also important. In many countries, increases are introduced gradually with a relatively long lead time to enable individuals to adjust their behaviour, especially with respect to savings and employment planning, and do not affect people close to retirement or existing pensioners. Thus, they do not usually decrease the cost of the program

immediately. In this way it might be perceived by younger generations as unfair to them, especially in countries with large upcoming cohorts of retirees.

Resorting to an immediate increase in eligibility age as a drastic measure to restore a program's financial sustainability can have unintended results and, under normal conditions, is likely to be unwise. At the least, this warrants a comprehensive review. (See the case study of Italy below.)

5.5. National experience

To provide further insight into the effects and possible resolution of the issues discussed above, the circumstances of selected countries are discussed in the following.

Australia

According to the Productivity Commission (2013), the effect on Australia's budget in certain expenditure categories due to an ageing population is shown in Table 5.1.

	Share of GDP (%)		
	2011-2012	2059-60	Change
Health care (Commonwealth and States)	6.5	10.8	4.3
Age pension (Commonwealth)	2.7	3.7	1.0
Aged care (Commonwealth)	0.8	2.6	1.8
Disability (States)	0.2	0.5	0.3
Education (Commonwealth and States)	5.4	4.9	-0.5
Total	15.6	22.5	6.9

Table 5.1 Effect of selected budget items in Australian budget
source: Productivity Commission (2013)

An observation from this table is that out of the increase of 6.9% of GDP brought about by the ageing of the population, the Age pension only accounts for an increase of 1.0% of GDP.

Australia currently has an eligibility age of 65 years, which is legislated to increase to 67 by 2023. The Productivity Commission investigated the effect of increasing the eligibility age from 67 to 70 between 2023 and 2035. The result was a net saving of 0.15% of GDP after reflecting the effects of increased cost of disability pensions and unemployment benefits.

This saving appears relatively small. Even smaller savings would be expected if the eligibility age was further increased because of the higher expected incidence of disability.

Canada

In 2012, the decision was made to gradually increase the age of eligibility for the Canadian first pillar program (Old Age Security – OAS) from 65 to 67, commencing in 2023 with full implementation by 2029. The effect of this increase has been estimated to be a reduction of expenses of a maximum of 0.3% of GDP. At the same time, the eligibility for unreduced retirement benefit from the CPP/QPP

earnings-related social security programs remains at age 65. Unless addressed, such discrepancy will create a discontinuity of income for certain population groups. For example, for recipients of the CPP disability pension, the disability benefit is converted to a retirement CPP benefit at age 65. However, since the CPP retirement benefit is smaller than the disability pension, the OAS plays an important role in ensuring income continuity. The federal government elected in October 2015 has committed in its election platform to reconsider this age increase.

Italy

In response to financial stress, Italy modified its social security program in December 2011. The major change was to increase the eligibility age. Effective 1 January 2012, the new eligibility age was set at 66 for male employees; for female employees the eligibility age will gradually increase to age 66 by 2018. The eligibility age will increase according to actual increases in life expectancy published by the National Institute of Statistics. From 2021 the minimum eligibility age will be 67.

The speed with which these measures were introduced caused some anomalies and widespread protests. For example, a significant number of workers had agreed to leave employment and suddenly discovered a gap between their date of retirement and the date that they could claim social security benefits. A number of supplementary provisions were needed to be enacted to resolve the problems caused by the implementation of the changes over such a short time period.

Israel

In Israel, historically the social security eligibility age was 65 for males and 60 for females, in recognition of greater demands of family roles of many females. When its social security program had to increase the eligibility age to remain solvent, it increased the males' eligibility age to 67 over a period of several years. However, a fierce political struggle ensued with regard to the eligibility age for females.

The report "The Status of Women in Israel 'Beijing +20'" submitted by the State of Israel states:

"A recent campaign by the ad-hoc group, The Coalition of Organizations Against Raising Women's Retirement Age in Israel reveals the socio-political-conceptual sophistication of feminist groups, their involvement in the labour market, and their ability to progress beyond anachronistic demands for formal and numerical equality towards more nuanced understandings that, sameness in the context of inequality is substantively unfair..."

Israeli women are caught between two problems – ageism and sexism – in the context of a segregated work market, discrimination against women, and persistent wage gap.

Thus, raising the retirement age places women in a particularly precarious position. Binding women to the labour force by law will only make them poorer. Since most women don't earn as much as men, and since some working women subsist under conditions of 'deep unemployment', raising the age of retirement doesn't mean more years of paying into the system – it means an extended period of poverty. Furthermore, when a woman is finally entitled to receive her pension, it will never suffice to pay off the debt or relieve the despair that she will have accumulated."

On the other hand, different eligibility ages can be viewed as discriminatory against females, as well as preventing or dissuading them from participating in the labour force at more advanced ages. Consequently, various female eligibility ages were proposed: 67 like males, 65 (i.e., 2 years less than

males), 64, and 62. Eventually, a political compromise forced an immediate increase to 62, with a future planned increase to 64.

France

The reforms of the French pension system aimed at postponing retirement have not been adopted easily.

The financial situation is quite dire for two national occupational 2nd tier pension plans that cover private sector employees: AGIRC (Association générale des institutions de retraite complémentaire des cadres) and ARRCO (Association pour le régime de retraite complémentaire des salariés). Together they had €3.1billions of deficit in 2014, with a forecast of no further financial reserves in AGIRC by 2018 and 2027 for ARRCO. As a result of negotiations between employers and unions regarding AGIRC-ARRCO, it was agreed, among other measures, to implement from 2019 significant reductions in the amount of pensions for those who will retire between age 64 and age 67 even if they have contributed the required number of years. For instance, a salaried worker who retires at age 64 will see his AGIRC-ARRCO pension reduced by 10% for the first three years and will receive full pension benefits at age 67. Further, a postponement of retirement will result in additional pension benefits paid for one year. This one –time “bonus” will be equal to 10% of the pension for a person delaying retirement by 2 years, 20% for a delay of 3 years, and 30% for a delay of 4 years. These changes were accompanied by the increase of the so called “call up rate” (a surcharge on regular contributions that provide right to benefits) from 25% to 27%. Further, the reference salary that is used to calculate the number of acquired points giving right to benefits will increase faster than actual wages. So for the same amount of contribution (including the call up rate) the salaried workers will get less points and therefore less pension. This effect will lead to lower salary replacement rates especially for the younger employees.

Starting from February 2016, the negotiations will take place between representatives of the employers and the unions to discuss how to reduce the deficit of the unemployment regime “UNEDIC”. One of the two hot topics of these negotiations will be decisions on whether to shorten the period of payment of unemployment allowances from 2 years before age 50 and 3 years after, and whether to decrease allowance amounts. This unemployment reform will have an impact on retirement income since the unemployment allowances are subject to pension contributions that give pensions rights.

Another feature of the current French reform proposal is an attempt to introduce different eligibility requirements for individuals working in strenuous occupations. The government expressed the desire to differentiate required contributions periods by type of work. The January 20, 2014 Law on pension created the “Compte pénibilité”. The two main challenges of this design are finding non-questionable factors of arduousness and non-availability of the required human resource capabilities to assess and implement this by medium and small companies. As a result, the full application of this account was postponed to July 1, 2016.

United Kingdom

The UK Pension Act 2014 made major changes to UK State Pensions. It legislated an increase in State Pension age from 66 to 67 by 2026-2028. The major change of the act was to introduce a “periodic review of rules about pensionable age”.

The legislation is focused on the review of the State Pension age and its appropriateness. If it is found that the age should be changed, the government will introduce the required legislation. It is not automatic.

The Pension Act 2014 specifies certain parameters to consider in the determination of the State Pension age. These parameters and the current suggested interpretations are:

- Proportion of life spent in retirement (one-third)
- Age at which adult life starts (twenty)
- Measure of life expectancy (unisex cohort life expectancy)
- Mortality basis (UK principal population projections produced by the Office for National Statistics).

The UK Government Actuary's Department is expected to play a major role in the review process. However, the interesting feature of the review process is that the required report has to consider certain factors relevant to the review, including:

- Labour market issues, especially participation rates and any differences by UK regions
- Interaction of State Pension with other pillars of the retirement system
- Age-related sickness and disability, and healthy and disability-free life expectancies, how they differ between different regions or parts of the labour force, and any trends in these matters.

See Lunnon (2015) for more details.

5.6. Harmonisation of the eligibility age with changing work patterns

Working longer can be beneficial for many people's physical and mental health, although this beneficial effect may depend on the nature of their work performed. As a result, earlier retirement may result in additional health care cost to society.

Society needs to assess and regularly reassess how to deal with increasing longevity. If done appropriately, the additional years of life can be of high quality, proving of great benefit to the individual and adding to the collective wellbeing of humanity. A major consideration is how to keep older people (at least those in good health) involved in productive activities. As usual, there is a tension and inter-connection between economic and social forces, in addition to individual considerations.

Even if an individual wants to delay exiting the labour force it may prove impossible. According to International Longevity Centre – U.K. (2015), there is a “large number of people aged 50-64 who are out of work involuntarily – pushed out through a combination of redundancy, ill health, or early retirement.” It further says that “This sizable cohort is still willing to work yet is prevented from doing so.”

Chart 5.1, based on 2006 data, shows that in the OECD countries for individuals aged 50-64 the three main pathways out of employment are retirement, unemployment and disability. Although not evident directly from the chart, there is a strong correlation between a country's higher eligibility age and the share of older individuals who exit the labour market due to unemployment. With the recent increase in the eligibility age in several countries, combined with the removal of early retirement programs (e.g., in Denmark and the Netherlands), the share of labour exits through unemployment has likely increased since these changes were made.

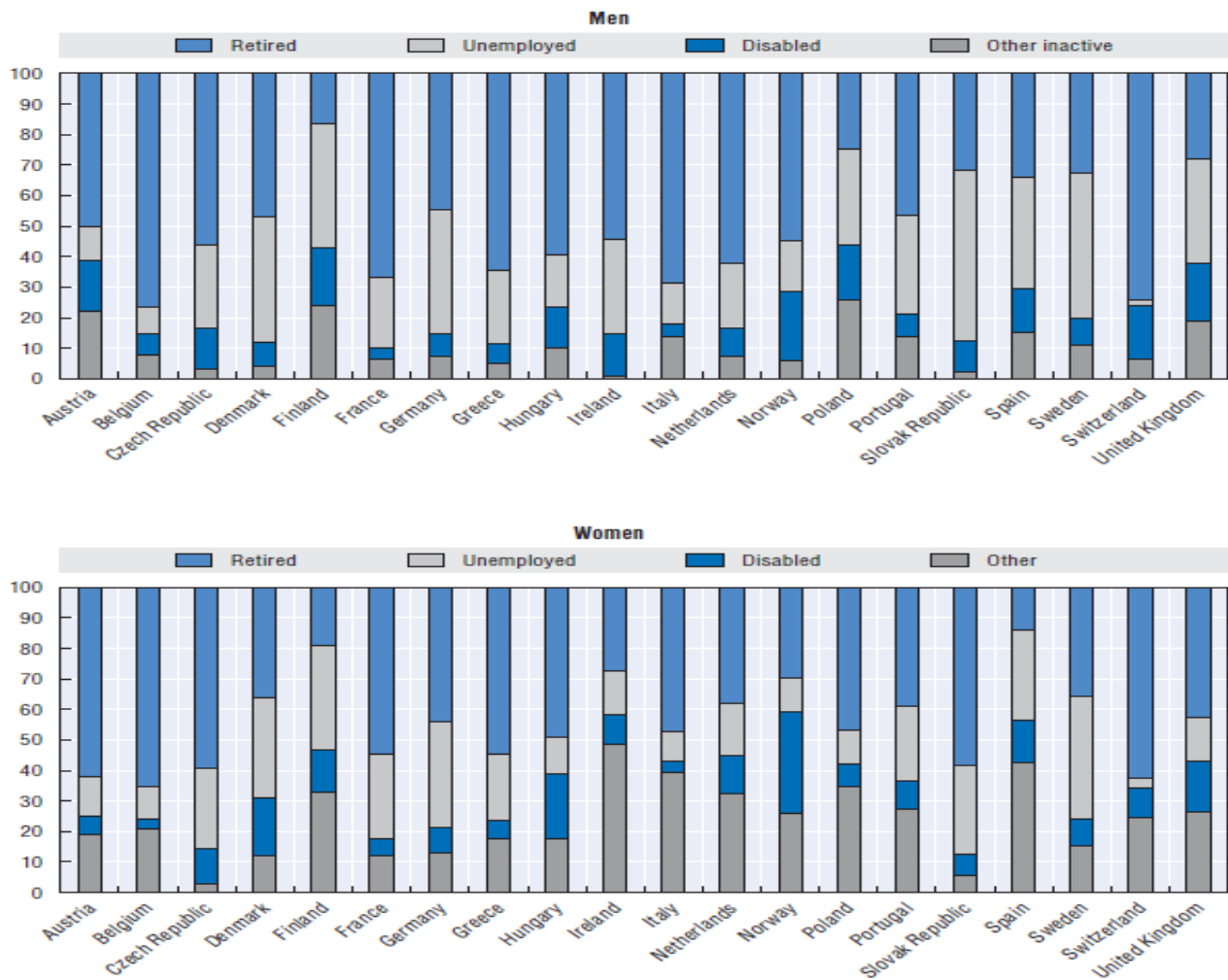


Chart 5.1 Pathways out of employment (ages 50-64)
source: OECD (2006)

Numerous studies, such as OECD (2011), on how to facilitate work for older people have been published by national and international organizations. Considerations with respect to hiring and retaining older workers include higher labour costs, availability of training or retraining and the actual or perceived ability of older workers to receive training, labour-market regulations and willingness of employers to adapt working conditions to the needs of older workers.

Impact of eligibility ages on labour markets

A thorough assessment of the interaction between labour markets and pension programs is beyond the scope of this report. Some argue that only pension programs based on a strictly actuarial relation between benefits and contributions (mainly DC plans) do not distort labour markets. However, as discussed in Barr and Diamond (2006), “minimising labour market distortions is not the right objective – policy has to balance labour-market efficiency against the various objectives of pension schemes.”

Some believe that by working longer, older workers will take jobs from the young, who have experienced high unemployment rates. In general, this is false based on the so-called lump-of-labour fallacy (the assertion that the amount of work available to workers in an economy is fixed, which is incorrect). Ignoring the effect of this fallacy has prompted several European countries to introduce early retirement programs to reduce youth unemployment. The Dutch case was discussed earlier in this

report. Another notable example mentioned earlier is the Danish early-retirement program, which has been significantly reformed. As was stated in the OECD Economics Surveys: Denmark 2012:

“[In Denmark, a] voluntary early retirement program (VERP, ‘Efterlønnen’) was introduced in 1979 at a time of high unemployment, especially amongst youth. Its purpose was to change the composition of the work force, with the idea that it would allow older people to retire in order for younger people to take their place. In fact, it led to a decrease in overall employment rates, as in many other OECD countries with similar policies.”

Chart 5.2 shows that the employment rates of younger and older workers are positively correlated. Thus, policies addressing youth and seniors unemployment should in general go hand in hand.

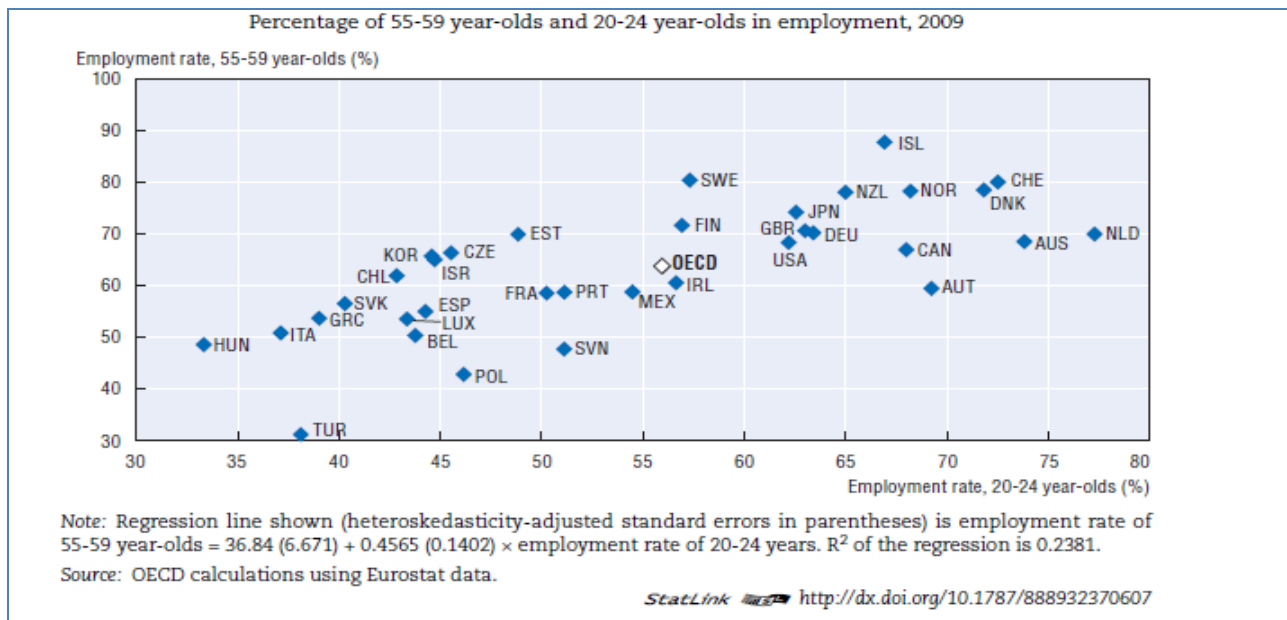


Chart 5.2 Employment rates of younger and older workers

Other issues outside the scope of this report

Additional issues not addressed in this report include, among others, (1) the effect on increased tax revenue by having people in the labour force work longer and (2) the effects (possibly hardships) on older age employees who are unable to continue in jobs involving manual tasks.

5.7. Summary

Increasing the eligibility age in a defined benefit pension plan can help meet employer objectives with respect to sustainability and affordability. Other benefits (early retirement, late retirement, death and disability) can be modified to integrate with the new eligibility age. For defined contribution plans, an increase in eligibility age will usually result in higher benefits and a reduction in the decumulation period. For both types of plans, in order to achieve actuarial neutrality, due to the combination of greater cumulative investment return, a greater amount of contributions and a shorter period to receive benefits, an increase in the eligibility / retirement age should be less than the increase in expected longevity.

Regarding social security programs, each country needs to make an assessment of its needs and ways to increase its eligibility and retirement ages according to its own set of demographic, economic, social,

cultural, and political circumstances and objectives. The resulting decisions should be based on a comprehensive macro- and micro-analysis of a wide range of population subgroups, as well as the proposal's aggregate financial effects. An increase in eligibility age in social security retirement programs may need to be accompanied by changes to other social security and social welfare programs, as well as changes to the way employer-sponsored pension and personal savings are regulated and designed, as well as tax policy considered. A superior approach may result from a comprehensive review of retirement, savings, labour and tax policy, rather from ad hoc political decisions.

Two aspects require particular attention. First, as the eligibility age increases, so it is likely that the aggregate incidence of disability, ill-health and unemployment in the labour force will also increase. Therefore, the needs for and cost of other programs increase, although not necessarily by a corresponding amount. Second, baseline social security benefits are relied upon more by those in lower socio-economic groups, while longevity (and healthy longevity) gains have been greater for people in higher socio-economic groups. These differences create the need to assess the effects of any change for a range of participant situations.

Regarding the labour market, it has been found that many older workers find satisfaction and can enhance their physical and mental health benefits by continuing to work, where they are able to do so and where suitable work is available. In addition, increasing the number of older workers appears to be beneficial to the economy as a whole, with no evidence that increasing the eligibility age increases youth unemployment.

Appendix

Sources of relevant demographic and labour market data include:

- United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects <http://esa.un.org/unpd/wpp/>
- Population Reference Bureau <http://www.prb.org/DataFinder.aspx>
- Organization of Economic Cooperation and Development Statistical Database <https://stats.oecd.org/Index.aspx>
- International Labour Organization Database www.ilo.org/ilostat/
- Eurostat <http://ec.europa.eu/eurostat/data/database>
- World Health Organization <http://www.who.int/gho/en/>
- The World Bank <http://data.worldbank.org/>
- Graphical development of population pyramids and other related statistics over many years for many countries in <http://www.worldlifeexpectancy.com/world-population-pyramid> and in <http://www.worldlifeexpectancy.com/>

This Appendix includes samples of key demographic data from certain of these sources:

- A.1 Old-age dependency ratio
- A.2 Rate of population change
- A.3 Total fertility rate
- A.4 Life expectancy at birth
- A.5 Employment rates of those aged 55-64
- A.6 Income inequality for those aged 65 and over

Table A.1: Old-age dependency ratio (ratio of population aged 65+ per 100 population 15-64)

MAJOR AREA	1970	1980	1990	2000	2010	2015
WORLD	9.2	9.9	10.0	10.9	11.6	12.6
Sub-Saharan Africa	5.5	5.7	5.8	5.7	5.8	5.7
Eastern Africa	5.5	5.8	5.7	5.8	5.8	5.9
Middle Africa	6.0	6.1	6.1	5.9	5.7	5.7
Northern Africa	7.3	7.2	7.4	7.9	7.9	8.4
Southern Africa	6.4	5.7	5.6	6.5	7.7	7.5
Western Africa	5.1	5.4	5.7	5.4	5.3	5.3
Eastern Asia	7.0	8.1	8.9	11.1	13.1	15.3
South-Central Asia	6.2	6.5	6.6	7.2	7.8	8.3
Central Asia	10.6	9.5	8.1	8.6	7.6	7.4
Southern Asia	6.0	6.3	6.6	7.2	7.8	8.3
South-Eastern Asia	6.9	6.9	6.9	7.7	8.2	8.8
Western Asia	8.0	8.3	7.4	8.1	7.7	7.9
Eastern Europe	12.9	16.2	16.3	18.8	19.8	21.1
Northern Europe	19.9	22.5	23.3	23.7	24.5	27.9
Southern Europe	15.7	18.2	19.4	24.3	27.3	30.8
Western Europe	20.7	22.4	21.2	23.7	28.1	30.6
Caribbean	8.9	10.3	10.9	11.8	13.2	14.3
Central America	7.1	7.2	7.4	8.2	9.1	9.7
South America	7.4	7.7	8.0	8.9	10.5	11.8
Canada	12.9	13.8	16.5	18.4	20.4	23.8

Determination of Retirement and Eligibility Ages

United States of America	15.7	17.2	19.0	18.5	19.4	22.3
Australia/New Zealand	13.3	14.9	16.6	18.4	19.9	22.7
Melanesia	4.2	4.4	4.6	4.8	5.5	5.8
Micronesia	5.3	5.8	5.9	6.2	7.8	9.4
Polynesia	5.4	5.9	6.7	7.8	9.5	10.2

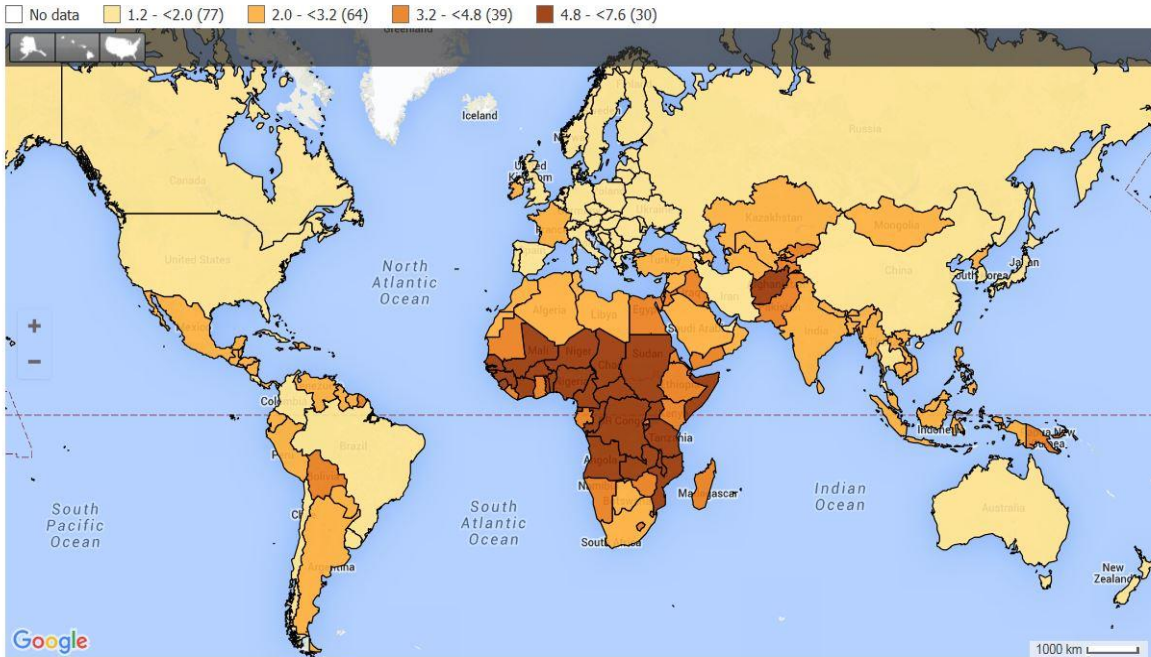
Source: United Nations, Department of Economic and Social Affairs, Population Division (2015).
World Population Prospects: The 2015 Revision, DVD Edition.

Table A.2: Average Annual Rate of Population Change (percentage)

MAJOR REGIONS	1980-1985	1985-1990	1990-1995	1995-2000	2000-2005	2005-2010	2010-2015
WORLD	1.78	1.80	1.54	1.32	1.24	1.22	1.18
Sub-Saharan Africa	2.81	2.81	2.72	2.63	2.66	2.73	2.71
Eastern Africa	2.93	2.99	2.56	2.82	2.75	2.82	2.81
Middle Africa	2.81	2.95	3.37	2.72	3.04	3.09	3.03
Northern Africa	2.80	2.61	2.33	1.76	1.68	1.72	1.89
Southern Africa	2.55	2.30	2.39	1.65	1.43	1.33	1.17
Western Africa	2.75	2.69	2.70	2.61	2.65	2.74	2.74
Eastern Asia	1.41	1.67	1.14	0.65	0.53	0.50	0.46
South-Central Asia	2.40	2.29	2.04	1.87	1.68	1.48	1.37
Central Asia	2.05	1.94	1.07	0.72	1.03	1.36	1.60
Southern Asia	2.42	2.31	2.08	1.91	1.71	1.49	1.36
South-Eastern Asia	2.30	2.08	1.77	1.55	1.36	1.16	1.20
Western Asia	2.85	2.48	2.30	2.08	2.14	2.46	2.00
Eastern Europe	0.58	0.41	-0.03	-0.38	-0.42	-0.20	-0.11
Northern Europe	0.18	0.31	0.24	0.27	0.39	0.70	0.53
Southern Europe	0.47	0.23	0.10	0.13	0.64	0.48	-0.13
Western Europe	0.15	0.44	0.59	0.25	0.26	0.24	0.32
Caribbean	1.41	1.38	1.23	1.04	0.88	0.78	0.74
Central America	2.25	2.09	2.02	1.77	1.42	1.57	1.39
South America	2.16	1.92	1.68	1.54	1.38	1.16	1.05
Northern America	0.96	1.02	1.05	1.18	0.92	0.93	0.78
Australia/New Zealand	1.31	1.45	1.24	1.04	1.22	1.67	1.43
Melanesia	2.61	2.18	2.37	2.38	2.23	2.18	1.98
Micronesia	3.22	3.01	2.36	1.26	0.26	-0.04	0.93
Polynesia	1.55	1.32	1.12	1.11	0.91	0.59	0.73

Source: United Nations, Department of Economic and Social Affairs, Population Division (2015).
World Population Prospects: The 2015 Revision, DVD Edition.

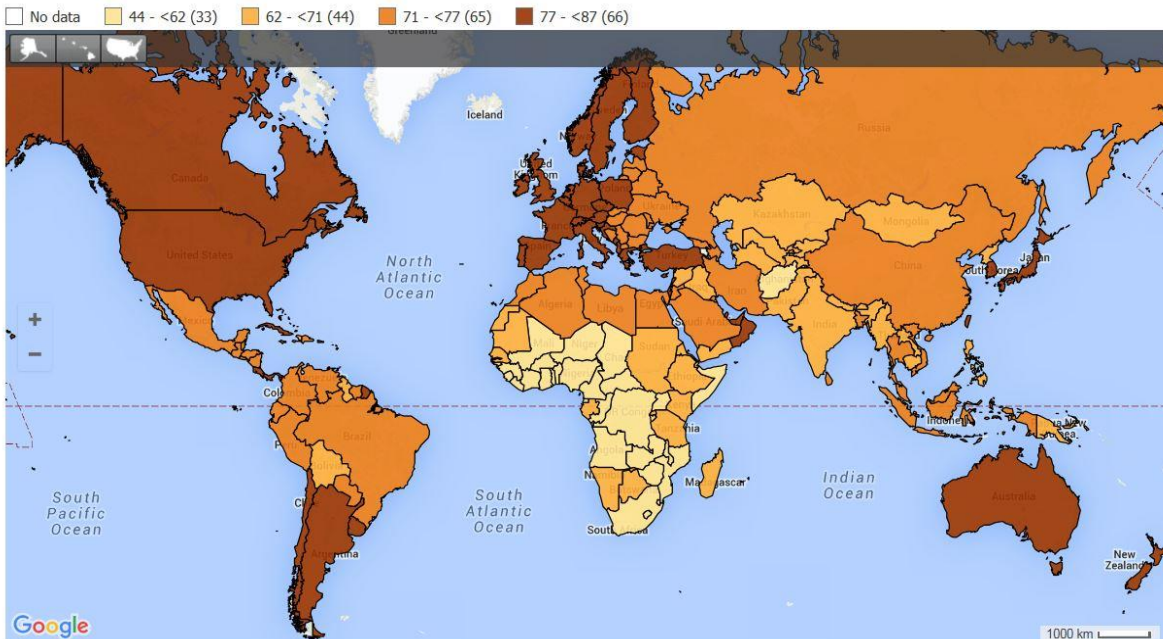
Chart A.3: Total fertility rate (number of children per female, 2014)



Source: PRB 2014 and 2015 World Population Data Sheets.

Notes: Average number of children born to a woman during her lifetime. Data denoted as "2014" are for 2014 or the most recent year for which data are available.

Chart A.4: Life expectancy at birth, both sexes (2014)



Source: PRB 2014 and 2015 World Population Data Sheets.

Notes: Data denoted as "2014" are for 2014 or the most recent year for which data are available.

Table A.5: Employment rates (2014)

Country	Age group 55-59	Age group 60-64	Age group 65+
Argentina	67.8	51.5	14.8
Australia	70.3	51.6	12
Austria	63.1	23.3	5.2
Belgium	59.4	23.6	2.3
Bhutan	81	70.9	38.7
Bulgaria	64.9	35.3	3.8
Canada	69.3	50	12.9
Croatia	47.6	23.9	3
Cyprus	57.9	35.3	7.2
Czech Republic	76.9	32.2	4.9
Denmark	78.2	47.5	7.1
Estonia	74.2	53	10.5
Finland	74.1	44.3	5.7
France	68.3	25.1	2.3
Georgia	73.8	70.5	42.6
Germany	77.2	52.6	5.8
Greece	43.9	24.1	2.5
Hong Kong, China	62.8	39.8	8.5
Hungary	63.2	19.4	1.8
Iceland	85.4	81.5	36
Ireland	61.4	43.6	9.8
Italy	60.1	31.1	3.7
Japan	78.1	60.7	20.8
Korea, Republic of	70.8	58.3	31.3
Latvia	69.9	40.6	6.9
Lithuania	69	40.9	5.7
Luxembourg	58.1	23.1	4
Macedonia	51.6	23.5	1.9
Malta	52.4	22.3	5.3
Mexico	60.5	47.8	26.6
Moldova, Republic of	50	29.6	8.9
Netherlands	71.5	49	7.3
New Zealand	81.3	70.3	21
Norway	79.7	63.9	10.9
Paraguay	70.5	60.9	33.6
Poland	57.2	26.3	4.7
Portugal	57.8	37.1	11.7
Romania	54.9	30.3	10.8
Saudi Arabia	53.2	33.8	17.6
Slovakia	66.1	21.1	1.9
Slovenia	50.4	18.9	6.7
Spain	54	33	1.6
Sweden	81.9	66	16.4
Switzerland	82.3	59.2	11.7
Turkey	34.7	27.1	11.2
United Kingdom	72.7	48.2	10.1
United States	68.3	53.3	17.7
Uruguay	76.5	52.5	16.1
Viet Nam	78.4	66.6	28.8
Zimbabwe	88.3	88.4	73.3

Source: ILO

Table A.6: Income inequality for people aged 65 and over (2013)*

Country	Total	Males	Females
Austria	4.1	4.0	4.0
Belgium	3.1	3.3	2.9
Bulgaria	4.6	4.2	4.8
Croatia	5.1	4.7	4.8
Cyprus	4.8	5.6	4.1
Czech Republic	2.4	2.3	2.5
Denmark	3.2	3.4	3.1
Estonia	3.1	3.3	2.9
Finland	3.3	3.4	3.1
France	4.1	4.1	4.0
Germany	3.8	3.9	3.7
Greece	3.9	4.0	3.8
Hungary	2.8	2.9	2.7
Iceland	3.0	3.3	2.7
Ireland	4.1	4.2	4.1
Italy	4.4	4.5	4.3
Latvia	3.9	3.9	3.9
Lithuania	3.9	3.8	3.8
Luxembourg	4.1	4.5	3.7
Malta	3.2	3.5	3.1
Netherlands	3.2	3.2	3.2
Norway	2.7	2.6	2.8
Poland	3.4	3.3	3.4
Portugal	4.9	5.1	4.8
Romania	4.5	4.0	4.6
Serbia	6.4	6.1	6.5
Slovakia	2.3	2.3	2.3
Slovenia	3.5	3.3	3.6
Spain	4.5	4.6	4.3
Sweden	3.4	3.3	3.4
Switzerland	4.5	4.7	4.3
Turkey†	10.6	10.4	10.5
United Kingdom	3.8	3.8	3.8

†2006.

*The ratio of total income received by the 20% of the population with the highest income (top quintile) to that received by the 20% of the population with the lowest income (lowest quintile). Income is understood as equivalent disposable income.

Source: Eurostat

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Glossary

Actuarial fairness. [see actuarially neutral]

Actuarially neutral. Equivalent cost in expected value on a collective basis, using the same demographic and economic bases in all cases – the program is neither advantaged nor disadvantaged by choices made by participants.

Automatic adjustment. As referred to here, an adjustment made in the eligibility age based on certain criteria, usually defined in law or in regulation.

Cross-subsidy. The extent to which one population subgroup financially supports another population subgroup.

Defined benefit (DB) pension plan. A retirement program sponsored by an employer for which retirement benefits are specified as a function of past wages and length of service. Contributions are made by the employer and, in many cases, the employee.

Defined contribution (DC) pension plan. A retirement program sponsored by an employer that normally consists of contributions by the employer and the employee. The retirement benefit is usually the accumulation with investment return from these contributions (less expenses) and hence there are generally no guarantees of the level of retirement benefits.

Early retirement. When retirement occurs at an age younger than the eligibility age, usually for an amount less than full benefits. Early retirement age is the earliest age a person can retire according to the rules of the plan or program.

Eligibility age. The age when an individual is eligible according to program rules to begin receiving full (i.e., not reduced or increased) retirement benefits.

Employer-sponsored plan. As used in this report these benefit plans, often referred to as pension plans, are normally sponsored by one or more employers or a union. They provide benefits, including retirement and disability benefits to employees (and their dependents) on a mandatory or voluntary basis.

Fairness. The relative treatment of one population subgroup compared with that of another. Actuarial fairness measures this treatment in terms of expected cost.

Full benefits. Benefits as defined in a retirement program with no adjustments for early or late retirement.

Late retirement. When retirement occurs at an age older than the eligibility age. The latest retirement age is the last age that additional benefits due to delayed retirement are not accumulated further.

Old-age dependency ratio. As used in this report, the ratio of the number of those who benefit from a social security program relative to those who contribute to the program. This ratio is often expressed in terms of the number of those aged 65+ in a population to those aged 15-64, although it can also be related to an increasing eligibility age or begin at a somewhat older age. Other forms of a dependency

ratio can include children or other dependents. The support ratio is the reciprocal of the dependency ratio.

Old-age support ratio. The reciprocal of the old-age dependency ratio.

Phased retirement. Reduction in amount of work, in one or more stages, usually a move from full-time to part-time and ultimately to complete cessation of work over a period of years. It may involve doing the same or a different job.

Replacement ratio. The ratio of the benefits provided by a retirement program to a measure of prior earnings.

Retirement age. The actual age when a person substantially leaves the work force. In the current era, retirement age is not a precise concept because many employees reduce their working commitments gradually, rather than abruptly moving from full-time work to total retirement.

Social security program. A government-sponsored program in which all or almost all of the population of a country participates. Contributions are usually made by employees and employers, although they may be supplemented by other sources. Benefits are payable to those eligible, often in the form of cash payments after a certain age (eligibility age) or event (e.g., disability, health care use or unemployment).

Social welfare plan. A government-sponsored program that pays certain benefits, often in the form of cash payments after a certain age or event, to those who qualify, viewed as a safety-net program. Qualification for benefits may be based on income or other resources less than a specified amount or similar criteria.