

AVERAGE REMAINING LIFETIMES CAN INCREASE AS HUMAN POPULATIONS AGE

Background

Should Age at Retirement Depend on Remaining Life Expectancy?

We need to broaden the way we think about population aging. Normally, we discuss aging in a country only in terms of the number of years the average person has lived. This approach is incomplete and can be highly misleading. It is crucial that we expand our approach to aging by also considering the number of years the average person has left to live. Without this it would be impossible to devise policies appropriate for an aging society.

In the year 2000, the average German was 39.9 years old. We forecast that the average German will be around 51.9 years old in 2050. From these sorts of figures, it appears that Germany will experience rapid aging during the first half of this century. But this is hardly the whole story. The average German in 2000 had to plan for an average of 39.2 remaining years. Despite the rapid aging, the average German in 2050 [now 52 years old, not 40] will still have to plan for around 37.1 more years of life. The planning horizon of the average German will change only by around 2.1 years over the 50 year period. Middle age in Germany, which came around the age of 40 in 2000, will come around age 52 in 2050.

In 2000, the average American was 35.3 years old, 4.6 years younger than the average German. In 2050, we expect that the average American will be around 41.7 years old, a full 10.2 years younger than the average German. In 2000, the average American had to plan for 43.5 years of remaining life. In 2050, the average American will have to plan for a future lifetime of around 45.8 years. Even though the average American will be 6.4 years older in 2050, his remaining lifetime will be longer by roughly 2.0 years. Comparable figures for the UK and France would lie between those of Germany and the United States.

On the one hand, populations will be older in the future. But on the other hand, the average person may have an even longer time horizon. In those areas of life where the planning horizon is important, such as in savings and in the maintenance of skills relevant to leisure or employment, the older people of the future could act as though they were effectively younger (because they will be looking forward to more years of life).

Older people in the future will not behave like today's older people. In many ways, they will behave as though they were much younger. This paper is devoted to a study of the interactions between aging and planning horizons. These interactions are likely to have significant effects in many areas from the planning of retirement communities to the sustainability of pension systems

A person's conventional age is the number of years the person has already lived. This is a backward-looking concept, and we often call this a person's retrospective age. We propose a new age concept in this paper, called a person's prospective age [this is called standardized age in the paper]. Prospective age is a forward-looking concept based on the person's remaining life expectancy.

For example, all people who have a retrospective age of 30 were born 30 years earlier. All people who have a prospective age of 30 have the same remaining life expectancy as a 30-year old person in the year 2000. People of the same (retrospective) age have lived the same number of years. People of the same prospective age have the same number of years left to live.

It is crucial that both perspectives be incorporated into studies of aging. How many years a person has lived is a crucial determinant of many biological processes. How many years a person has left to live is a crucial determinant of many decisions that a person makes, including those that have to do with savings, medical care, education, and the maintenance of work-oriented skills.

Population aging is defined as the change in the age of the average (or average) person over time. But now since we have two measures of age, we also have two measures of aging.

Japan and the US are examples of countries that will age very differently. This is mainly due to large differences in birth rates and immigration. Fertility is much higher in the US than in Japan and immigration is also higher. Higher birth rates and immigration in the US cause aging to happen much more slowly there.

Whereas people get one year older for each year that they live, populations can also grow younger. Indeed, a population can be growing older in terms of its retrospective age while growing younger in terms of prospective age. This is not a contradiction. The two perspectives can sometimes produce different trends. Both need to be taken into account to get a complete picture.

In this paper, we present past data and forecasts of the (retrospective) average age and the perspective average age for Germany, Japan, and the United States.

Over time there is a kind of race between aging and life expectancy improvements. In most countries, populations are getting older when measured in the conventional way and life expectancies are increasing. Sometimes when the age of the average person is increasing very slowly and life expectancy is increasing rapidly, the average person has an increasing number of years of remaining life. Sometimes when the age of average person is increasing very fast and life expectancy is increasing slowly, the average person has a decreasing number of years of remaining life.

Our paper shows the interplay of these two measures of aging. In Japan, the average person was 41.3 years old in 2000 using both the prospective and retrospective age

measures. This is not an accident. In each country, we computed prospective ages so that they would be identical to retrospective ages in 2000. In 2020, we expect that the average person would be 48.3 years old measured conventionally, and 44.6 years old using his prospective age. In those 20 years, the Japanese population will be growing older regardless of which age concept we use.

In the United States, the average person was 35.3 years old in 2000 (again, both in terms of retrospective and prospective ages). In 2020, we expect that the average person would be 37.7 years old using the retrospective age measure, but the prospective age of this 37.7-year-old person will only be 34.2 years. In other words, in contrast to Japan, the United States population will be growing older in one sense, while growing younger in the other.

Another way to incorporate the effects of increases in life expectancies into the analysis of aging is to compute old-age dependency ratios (the number of people over retirement age divided by the number of people in the working ages). Again, we do this in two ways. The first is the conventional way, where the age at retirement is assumed to be fixed. The second assumes that, in the long run, the age at retirement increases such that both working life spans and durations of retirement increase with life expectancy. If life expectancy continues to increase at its current pace, the increase in the retirement age that we assumed would be about 2 months per year.

For Japan, both the conventional and the adjusted figures increase. From 2000 to 2020, the conventional old-age dependency ratio increases from 276 people above the retirement age per 1,000 people in the working ages to 518, almost doubling. The adjusted figure also increases, but not by nearly as much, rising to 417. In the United States, the conventional old-age dependency ratio increases from 209 people above the retirement age per 1,000 people in the working ages in 2000 to 276 in 2020. In contrast, the adjusted old-age dependency ratio actually declines a little to 206 people above the retirement age per 1,000 people in the working ages.

In the United States, the increase of 2 months per year in the age at which a full Social Security pension could be received would virtually guarantee the sustainability of the pension system without reducing promised benefits. In Germany and Japan the pace of increase that would enable the government's pension system to be sustainable would only have to be a bit higher.

Clearly, any increase in the age of receipt of a full public pension is painful. The main question is not whether or not such a reform would be unpleasant, but how to share the burden of pension reforms across generations. Pay-as-you-go pension systems that do not include an increase in the age of full pension or a decrease in average benefits with increased life expectancies unfairly penalize younger generations. Without either of these changes, generations with longer and longer life expectancies require ever greater tax contributions from younger ones. This process is likely to be unsustainable with the burden of collapse falling on a generation that has paid taxes, but will receive only greatly reduced benefits. Intergenerational equity requires the sharing of the burdens of

reform. Increasing the age at which full public pension benefits can be received by a few months per year is one way to do this.

Frequently Asked Questions

1. What's new in this paper?

There are 3 main things new. First, we define a new age concept, prospective age that is complementary to the familiar concept of chronological or retrospective age. Retrospective age is the number of years a person has lived. Prospective age is the number of additional years a person is expected to live from his current age. Retrospective age and prospective age measure two different and equally important aspects of aging.

Second, we show that the dynamics of population aging are very different when you look at them from the vantage of retrospective age and prospective age. A population can grow older in terms of its retrospective age and younger in terms of its prospective age. Both need to be taken into account, when formulating policies relevant in an aging society.

Third, we show that if age at retirement increases by a few months per year, problems with pay-as-you-go public pension systems will be made more tractable in places like Germany and Japan and virtually eliminated in the United States.

2. Are you suggesting that an increase in the retirement age is the best policy to deal with the sustainability of public pension programs in developed countries?

No. This is not a policy paper. We give no recommendation to governments. In our paper we just conduct a scientific analysis. Governments are, of course, most welcome to use it in formulating their policies.

There are many approaches to dealing with the problem of the sustainability of public pension programs. In an environment of increasing life expectancies, maintaining fixed benefit schedules and ages at the receipt of a full pension often produces systems that are intergenerationally unfair and prone to collapse. We suggest that one way to improve the fairness of pension systems and to sustain them is to increase pension ages by a few months per year.

3. Is it fair that future generations are supposed to work longer until retirement?

Yes. It will be unfair with respect both to former and to future generations for them to work the same number of years regardless of their life expectancy. If people on average live 75 years and stay with labor force until 65, then they only enjoy 10 years of retirement or only 10/55 or 18% of their entire adult life (assuming that adult life begins at age 20). In a pay-as-you-go pension system,

these 10 years are funded through taxes on younger generations. When people live to 95, on average, and retire at age 65 they will enjoy in retirement for 30 years or 40% of their adult lives. These 30 years of retirement will need to be financed by taxes on younger generations. Paying ever increasing taxes to finance the pensions is unfair to the younger generations.

In formulating policies, it is important that the age at retirement not change dramatically from year to year. Slow smooth changes are best and indeed will work.

4. In plain English – what is the standardized or prospective age?

All prospective ages require a reference year. In the paper we used 2000 as the reference year. The prospective age of 30 year person in 2025, example, depends on that person's remaining life expectancy. If a 30 year old person in 2025 had a remaining life expectancy of 50 years, his prospective age would be age in 2000 at which people had a remaining life expectancy of 50 years. If a 27 year old person in 2000 had a remaining life expectancy of 50 years, then the 30 year old in 2025 would be given a prospective age of 27.

People with the same prospective age all share the same remaining life expectancy.

5. What is the standardized (or prospective) median age?

In a group of people, the median age is that age such that half the people in the group are older and half are younger. The most common way to measure how a population ages is to compute changes the population's median retrospective (or chronological) age over time. In this paper, we supplement this approach with a new one in which was also compute the population's median prospective age.

Prospective age is an important indicator of how people may behave in the future. For example, if someone is expecting to live a couple of years he is unlikely to buy a new house or invest in the stock market. But if someone expects to live another 20 years, his behavior may be very different.

6. Since the median perspective age in the United States is somewhat lower than in Japan does it mean that we should expect faster economic growth in the US?

We have not looked into the question of the relationship between changes in median prospective age and economic growth. There are many factors that influence economic growth. Population growth is surely one of these, but it is unlikely to be the most important one.

7. What does it mean if median perspective age is lower then the median retrospective age?

Nothing. It all depends upon the reference year. It only makes sense to compare the perspective age of the same population at different moments of time.

8. What does it mean if the median perspective age at one time is lower than at the other time?

If the median perspective age is lower in 2025 than in 2000, for example, it means that the average person in the population in 2025 has more remaining years expected life than the average person in the 2000 population had.

9. Why do you use probabilistic population forecasting techniques?

Probabilistic population forecasting techniques allow us to estimate the amount of uncertainty in our forecasts. It is important, in communicating with policy-makers, that we tell them not only what we think the future will be like, but also how uncertain we are about our forecasts.