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# The longevity economy

Andrew J Scott



The fact that people are on average living healthier, longer lives than previously has the potential to be positive for the economy, offsetting the negative economic effects of an ageing society. A longevity economy will see a shift in the mix of sectors in the economy, with both health and education expanding further and new financial products arising. Such an economy has the potential to contribute to growth in gross domestic product through employment and human capital. Shifting to a longevity economy requires less reliance on policies stated purely in terms of age, and more extension of existing policies aimed at diverse needs and circumstances to older age groups. This shift will be needed to counter inequality within age groups. A life course perspective is also required, to ensure a focus on intergenerational equity and a better understanding of the needs of older individuals that are not health driven.

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## Introduction

Two important demographic trends, a rising proportion of older people (defined herein as an ageing society) and a shift in the length of life (referred to herein as longevity), are exerting a substantial effect on society and the economy.<sup>1</sup>

The scale of the challenge that an ageing society represents is usually measured by the old-age dependency ratio (OADR)—ie, the proportion of people aged 65 years or older relative to those of working age. The UK OADR rose from around 10% in 1922 to nearly 30% currently,<sup>2</sup> and is projected to reach 50% by 2111 (figure 1A).

This projected increase in OADR creates two major policy concerns. One concern is that a fall in the proportion of the population who are of working age will lead to a decline in employment rates and so to lower gross domestic product (GDP).<sup>7</sup> The second concern is that such a change will lead to an increase in expenditure on pensions and health care and a rising level of government debt.<sup>8</sup>

Key macroeconomic variables for 1922 to 2111 show a trend increase for OADR, but indicate that government debt will end the period at a lower point than where it started, suggesting little connection between trend GDP growth and the OADR (figure 1A). Although health expenditure shares a similar trend to OADR, there are substantial differences in terms of timing, especially around late 1990s (figure 1B). Whatever the undoubted importance of demographics, figure 1 suggests that demography alone does not determine our macroeconomic destiny.

If the projected increase in the OADR (ie, a future doubling, compared with a tripling historically) is to be a dominant driver of economic performance, the data shown in Figure 1 suggest that one of two things has to hold either other factors that have previously offset the effects of ageing will no longer operate, or there are important non-linearities that mean the effect of an increasing older population is only felt above a certain threshold.

Both are of course possible. For instance, during the past century, education increased (average schooling in the UK rose from 3 to 10 years<sup>9</sup>) and the share of the population in the labour force rose from 42% to 51%,<sup>10</sup>

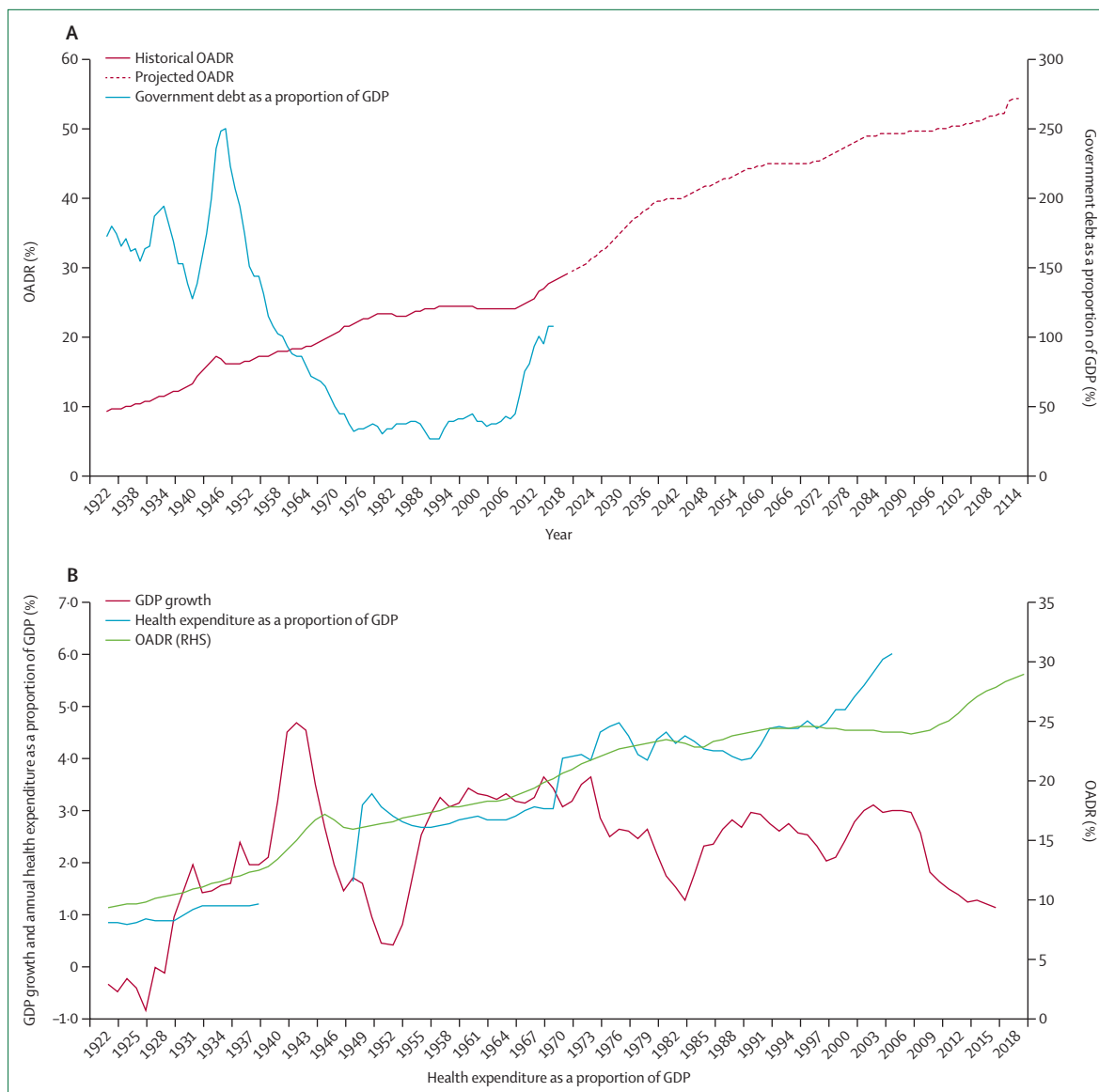
boosted in part by a rise in women's participation. Although both factors helped to offset a rising OADR in the past, repeating them in the years ahead will prove difficult.

Non-linearities could arise from health-care costs, which increase sharply for people aged in their 80s and 90s, who currently are the population group growing fastest (although see Zweifel and colleagues,<sup>11</sup> who claim that this expenditure is related to end of life and not age). A rise in the proportion of older voters might skew public spending towards so-called non-productive uses, such as pensions and older-age health care (although see Tepe and Vanhuysse<sup>12</sup> and Hollanders and Koster<sup>13</sup> for empirical evidence against this hypothesis). However, it is also possible that a positive offsetting effect might arise from longevity itself. If people on average are living longer, healthier lives, this fact should be a positive for the economy. Longevity should lead to increased education (human capital), greater investment in health, and higher amounts of personal savings—leading to the potential for a longevity dividend.<sup>14,15</sup> Past improvements in health and life expectancy have boosted GDP growth,<sup>16,17</sup> and the challenge now is to achieve the same outcome when life expectancy gains occur mainly in people aged 65 years or older. The goal is to achieve healthy longevity by exploiting the malleability of age and ensure that life is not only longer, but also healthier and productive for longer.

The potential of a longevity economy is the main focus of this Health Policy (for a survey of the macroeconomics of ageing, see Lee<sup>18</sup>). The focus is first on the labour market and issues of retirement, employment, and productivity. This is followed by a consideration of consumption, savings, and financial markets, and then the sectoral shifts that both ageing and longevity will bring about. A penultimate section considers implications for policy before the final conclusion.

## The labour market and retirement

The ultimate drivers of economic growth are investment in physical capital (eg, buildings, plant, and machinery), employment, human capital (eg, education and skills), productivity (output per worker), and innovation. Therefore, a key goal for the longevity economy is to raise



**Figure 1: OADR and macroeconomic trends**  
 (A) Historical and projected OADR and government debt as a percentage of GDP in the UK from 1922 to 2114. (B) OADR, GDP growth trend, and annual health expenditure in the UK from 1922 to 2018. Historical OADRs were calculated by the author by dividing the number of people aged 65 years or older by the number of people aged 20–64 years, using data from the Human Mortality Database.<sup>2</sup> Projected OADRs were calculated in the same way, using ONS population projections from 2019.<sup>3</sup> Data for government debt were taken from Ellison and Scott (2020).<sup>4</sup> GDP data are from the Bank of England.<sup>5</sup> GDP growth was calculated as a 10-year moving average using Bank of England data.<sup>5</sup> Health expenditure was based on Bank of England data (not available for all years).<sup>6</sup> GDP=gross domestic product. OADR=old-age dependency ratio. ONS=UK Office for National Statistics.

employment over the life course, which in turn will require boosting human capital and productivity as older workers seek to maintain their skills for longer.

**Postponing retirement**

An important component of boosting employment is the extension of working lives.<sup>19</sup> Estimates for the UK suggest that a 1-year extension of working life increases GDP by around 1%.<sup>20</sup> As a consequence, most Organisation for Economic Co-operation and Development member

governments have already implemented plans to raise the age at which state pensions become payable. The result is that people entering the labour force today can expect to work into their late 60s and beyond.<sup>21</sup>

Figure 2 shows the labour force participation rate (ie, the proportions of people who are employed or unemployed) for those aged 65 years or older across a range of countries. The participation rate of older workers is currently highest in low-income countries and higher for men than for women. The expectation is that

in future, labour force participation rates will fall in low-income countries and rise in higher-income nations, with the fastest increases likely to occur among women.<sup>23</sup>

Longer lives require longer working careers, unless real wages (ie, adjusted for inflation) rise enough to support increased leisure time.<sup>24</sup> Lower-income countries are expected to see more rapid growth in GDP and wages than in high-income countries, so working careers are expected to shorten in lower-income countries.

This rapid growth for the lower-income countries would repeat the historical experience of high-income countries. In the UK in 1881, nearly three-quarters of people aged over 65 years were in the workforce and life expectancy at age 65 years was around 11 years (table). By 1931, wage growth (and the introduction of a state pension in 1909, and modest further increases in life expectancy saw the labour-force participation rate of those aged 65 years or older fall to 48%. After World War 2, rapid growth in real wages offset increases in life expectancy and the participation rate fell as low as 5%. However, during the past two decades, continual increases in life expectancy at age 65 years and weaker growth in real wages have led to rising participation rates at older ages. Future trends in the length of working careers will depend on three factors: real wage growth; future gains in life expectancy at age 65 years; and the extent to which current employment patterns have already adjusted to past increases in life expectancy. If real wage trend growth continues to disappoint<sup>28</sup> while the historical trend in life expectancy persists,<sup>29</sup> the retirement age will need to rise even further. However, if a fourth industrial revolution<sup>30</sup> brings about higher wages, and life expectancy plateaus or even reverses,<sup>31</sup> working careers will not lengthen.

### Is there capacity for postponing retirement?

Two common objections to raising employment at older ages are whether the health capacity exists at older ages to support working longer and concerns about whether it will create unemployment among younger cohorts.

Although healthy life expectancy has failed to keep up with overall life expectancy, estimates suggest that there is substantial capacity to work for longer—on average (an important qualifier, given growing health inequality).<sup>32-35</sup> In the UK, estimates<sup>35</sup> based on health comparisons of the 1977 and 2013 cohorts suggest that the participation rate for people aged 55–59 years could increase by 5–10%, and for those aged 70–74 years, by 57–67%.

This potential for increased employment at older ages has already made itself apparent. From 2009 to 2019, growth in employment of people aged 65 years or older accounted for 16–30% of total employment growth in the UK, Germany, the USA, and France, and for as much as 75% in Japan.

However, raising employment at older ages is not simply an issue of increasing the state pension age.

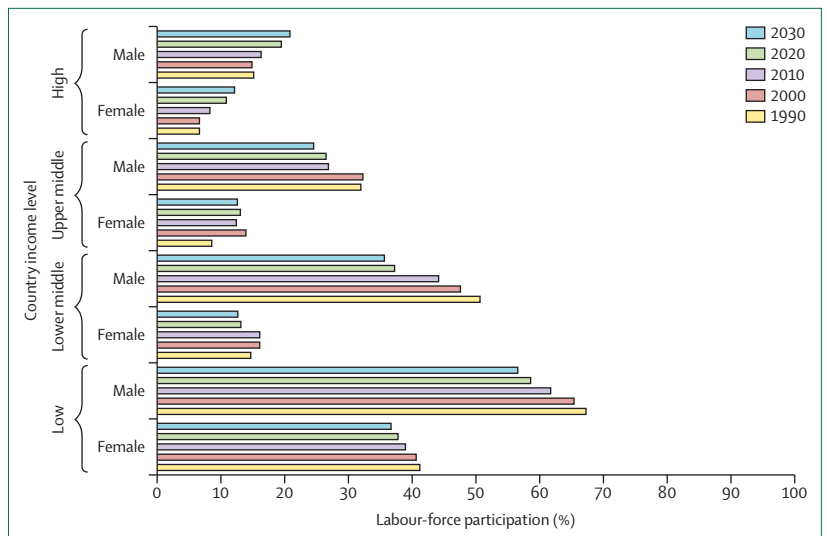


Figure 2: Historical and projected labour force participation rates from 1990 to 2030 for people older than 65 years, by sex and income level of country<sup>22</sup>

	Annualised real wage growth during the previous 10 years <sup>25</sup>	Proportion of people aged 65 years or older who are active in the labour force <sup>26</sup>	Remaining life expectancy at age 65 years (years) <sup>27</sup>
1881	1.97%	73.6%	10.8
1891	1.65%	65.6%	10.8
1901	1.65%	61.4%	11.4
1911	0.30%	56.9%	11.7
1921	0.38%	58.9%	12.1
1931	0.99%	47.9%	12.2
1951	1.41%	31.1%	13.0
1961	2.34%	24.4%	13.6
1971	2.63%	23.5%	14.1
1981	2.26%	10.3%	15.0
1991	2.97%	5.4%	16.2
2001	2.56%	5.0%	17.6
2011	0.41%	8.7%	19.6
2018	-0.33%	10.7%	19.9

Table: Trends in wages, labour force participation, and remaining life expectancy in the UK between 1881 and 2018

Longer working careers require additional education;<sup>36</sup> skills obsolescence and technological changes suggest that this should occur later in life. Increased adult education should therefore focus on upgrading existing skills, providing new skills for new roles, and supporting individuals through career transitions.

As Gratton and Scott<sup>37</sup> stressed, it is likely to be suboptimal to respond to longer lives by just raising the retirement age and stretching out a traditional three-stage sequence of learn, earn, and retire. Instead, a multi-stage career that facilitates a delayed start to working life, time for career transitions and adult education, and also time to care for both children and older parents. In other words, if

longevity and wage trends mean that working lives need to extend, then it will be necessary to factor in increases in leisure before, not after, retirement. This change requires very different corporate policies to the past around recruitment, retention, and promotion paths.<sup>38</sup>

The other common criticism of promoting employment at older ages is the fear that it will create unemployment for younger age groups. At an aggregate level, this is an example of the so-called lump of labour fallacy, which states that if output is fixed, boosting employment among older workers will lead to a lack of jobs for the young. Given that keeping older workers in employment means higher incomes, the notion of there being an unchanged amount of output seems unlikely. Just as the UK rise in female employment from 7 million to 16 million between 1951 and 2019 did not lead to a fall in male employment, nor should an increase in older workers lead to a fall in the number of jobs available for younger workers.

#### Implications of postponing retirement

Although there is much debate about the age of retirement, already retirement itself is a decreasingly shared key labour market transition whereby work comes to a sudden stop at a specific age. As people work longer, the age at which they stop work varies, unretiring (ie, returning to the labour force after retirement) becomes increasingly common, people switch to part-time rather than full-time work, or engage in caring or broader social activities.<sup>39</sup> As a result, older workers are characterised by increased diversity. This variety applies not only to employment, but also to health,<sup>40</sup> education, and a broad range of socioeconomic factors. As a consequence, chronological age plays a declining role in defining a common set of problems among older workers; labour market policies need to focus less on age and more on worker characteristics, as is already the case for younger groups.

The need for a broader lifecycle approach to the labour market is also apparent when considering younger generations, who face a combination of weaker lifetime income prospects,<sup>41</sup> less secure employment, and longer life expectancy. Such prospects might explain why one in five UK workers think they will never retire.<sup>42</sup> What is needed is a life course perspective on health, education, and employment, to support both productive ageing and intergenerational equity. Whereas an ageing society inevitably leads to a focus on older cohorts, the longevity economy is about shifts in behaviour at all ages.

#### The labour market: employment and productivity

A focus on retirement age distracts from the importance of maintaining employment from age 50 years or older. In the UK, labour force participation is 85% for people aged 50–54 years, but falls to 58% at age 60–64 years and to 23% at age 65–69 years.<sup>43</sup> Withdrawal from the labour market starts well before state pension age. If a longevity

economy is to be achieved, supporting employment among people aged 50 years or older will be key.

Although improving the health and education of older workers will boost their productivity, this will count for little if employers believe that older workers are not productive.<sup>44</sup> Evidence about the productivity of older workers is varied and often ambiguous, and varies substantially between sectors. Put simply, age does not seem to be as important a determinant of productivity as employers assume. This corporate ageism is a problem because it makes older workers more likely to lose their jobs and less likely to be hired than their younger counterparts,<sup>45</sup> which contributes to the decline in employment before retirement age. In the face of such corporate ageism, there is a growing trend of older workers moving into the contingent economy (eg, part-time, gig economy, or contract work) and entrepreneurship. In the UK, over 40% of working people aged 65 years or older are self-employed, which is much higher than for any other age group.

Supporting a longevity economy will require legislation to tackle age discrimination, but social shifts and economic incentives will also be important. For instance, social perceptions about the productivity of older workers will change in response to new cohorts of older workers who have more education and better health than in previous waves. Also, shrinking populations will result in fewer younger workers, which will persuade some employers to be increasingly interested in older workers. Similarly, an ageing consumer base and the ability of technology and robotics to sustain people's productivity will increase the appeal of older workers.<sup>46</sup>

#### Innovation and ageing

Unemployment is not the only way in which younger workers' labour market experiences could be affected by extended employment at older ages. As the ongoing debate about the role of women in the labour market shows,<sup>47</sup> although women's increased participation might not have affected male employment, there are many outstanding issues in terms of career and pay equality. The same might occur between generations

If organisations are hierarchical and promotion is dependent on tenure, longer working careers will see senior positions increasingly held by older individuals. This can be especially problematic for family businesses (eg, in the UK, Queen Elizabeth II is 95 years old; at age 72 years, her son Prince Charles has still not ascended to the throne).

Longer tenure and hierarchical structures are linked to the issue of the relationship between ageing and innovation. The rate of innovation is negatively associated with the proportion of older workers,<sup>7,48</sup> although as with so many issues around ageing and longevity, it is difficult to distinguish between social norms that might influence behaviour and underlying individual capacities. As people work longer, engage in increased amounts of adult

education, and undergo more career transitions, the innovative nature of older individuals might increase. Similarly, in sectors in which the customer base is overwhelmingly made up of older people, older workers might be best able to create the most valuable innovations.<sup>49</sup> Another possibility is that having an increased number of people alive and able to interact with one another across the generations could itself increase innovation.<sup>50</sup> However, there is a converse possibility, reflected in Max Planck's aphorism, which is that "science advances one funeral at a time."<sup>51</sup>

Evidence suggests that older workers have a different mix of skills to younger workers, and that diverse teams perform better.<sup>52</sup> Finding ways to ensure that older individuals remain innovative and discovering non-hierarchical structures that exploit intergenerational connections<sup>53</sup> will be important influences on the rate of future innovation. These issues are already proving to be a major challenge in higher-education institutions,<sup>54</sup> which are beginning to question the permanence of academic tenure in its current form. Experimentation and adaption will be required to discover how best to harness the skills of multigenerational teams.

### Consumption, savings, and finance

Ageing and longevity provide different implications for consumer expenditure, savings, and financial markets. The ageing society perspective, with its focus on the increase in the number of older people, leads to focus on a so-called silver economy and the rising spending power of those aged 50 years or older. By contrast, the key to longevity is additional time, which has important implications for intertemporal decisions such as consumption and savings, and brings with it changing behaviours and new financial demands.

### Shifting consumption patterns

Longer lives require a combination of saving more and longer. However, a shift towards a multi-stage life implies major changes in wealth dynamics over the life course. With the emergence of a three-stage life, the word pension

changed its meaning, from a regular sum paid to retain allegiance to a regular payment paid during retirement. As the relative importance of retirement within the overall life course declines, so too will a single-minded focus on pensions. Long-term wealth management will involve additional periods of accumulation and decumulation, as wealth is accessed during transitions and income varies across different life stages.

Consumption patterns will change in response to changes in ageing and health. The value of (non-medical) consumption depends upon health and for this reason, tends to decline with age.<sup>55</sup> The consequence is that if people live longer in better health, they will want to consume more in older age. This longevity effect will manifest itself not in increased expenditure on care homes and medical treatments, but on consumption and leisure activities that people will want to pursue in healthier, later years.

If healthy ageing (eg, further improvement in the relationship between health or biological age and chronological age) is achieved, health will have a reduced role in determining decisions at older ages, which raises the question of what will drive such decisions. Economics prefers to assume stable preferences over time, but longevity and its focus on the passage of time point to the need for a theory of ageing. How do the passage of time and ennui, variety, habits, or proximity to death or birth affect preferences?<sup>56</sup> If such factors do influence preferences, even if people aged 70 years now are the same biological age as past cohorts were at age 60 years, it is not the case that 70 is the new 60; 70 is nothing other than the new 70.

Longer lives will have important implications for intergenerational wealth patterns. Compared with previous generations, individuals will transfer an increased amount of their lifetime resources to themselves during later years. Although longer lives might mean increased time for wealth to accumulate, they could also affect the availability of bequests. The result could be an increased wealth gap between generations, if compared to each other at similar ages.

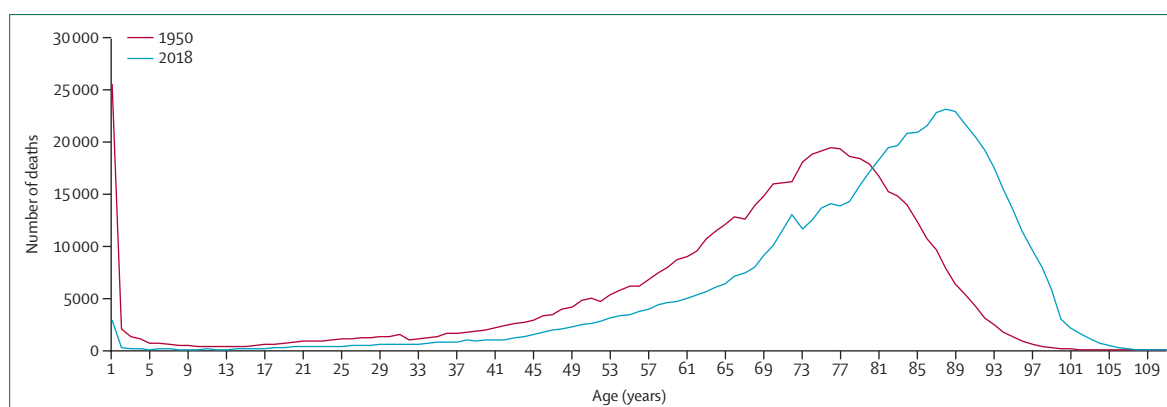


Figure 3: Comparison between 1950 and 2018 in the distribution of deaths by age in the UK<sup>2</sup>

### The rising importance of longevity insurance

In the UK, the risk of dying aged 40–70 years declined between 1950 and 2018, and the chances of living into one's 90s or older has increased substantially (figure 3). Age at death varies considerably between individuals; although the mean is 78 years, the median is 83 years, and the mode 87 years, which has important implications for the insurance sector. In the 20th century, dying before the end of one's working life was a major risk, and life insurance emerged to provide financial security for households in such an event. As life expectancy increased beyond even a raised retirement age, now the risk is of outliving one's finances (and skills, health, relationships, and sense of purpose), which requires new financial products focused on longevity insurance.<sup>57</sup>

In response, there is likely to be growing demand for annuities, deferred income annuities, tontines (whereby fund subscribers receive an annuity during their lifetime, the amount of which increases as the overall number of payees declines through death), and a raft of related, innovative products.<sup>58</sup> However, longevity risks involve not only the length of life but also health; diversity in ageing and the number of additional years spent in poor health raises the risk of high medical and care costs and represents another growing insurance market. Such variation points to a need to combine wealth and health products. For instance, life insurance company profits could be increased by offering customers policies that pay for health services that prolong healthy life.<sup>59</sup>

### The silver versus the evergreen economy

Discussions of an ageing society often emphasise the emergence of a so-called silver economy, which involves people aged 50 years or older. In the USA, spending by this age group is currently US\$7.1 trillion per annum and projected to rise to \$13.5 trillion by 2032.<sup>60</sup> In the UK, consumption in this age group is set to rise from £319 billion (54% of total consumption) to £530 billion (63%).<sup>61</sup> This growth in consumption shifts not just in pharmaceuticals and health, but also in recreation and culture, travel, and leisure goods and services. The estimated demand for recreation and leisure in the USA between 1990 and 2010 by those aged 50 and older increased by 75% and 90%, respectively.<sup>60</sup>

The focus on a silver economy by age-advocacy groups is understandable, as they aim to encourage firms to design products for this age group. However, from a macro-economic viewpoint, this focus does not represent a longevity-inspired boost to GDP, merely a shift in market share between sectors. For instance, the oft-stated fact that more adult diapers than baby diapers are sold in Japan is clearly important for firms, but has no implications for GDP growth.

Defining the silver economy by reference to a single age group runs counter to other aspects of the longevity society. Assuming a homogeneous grouping of

individuals reinforces the notion that age is a defining characteristic in a way that would not make sense if defining a market younger than 50 years. Failure to recognise the heterogeneity of the 50 years or older age group also hides substantial changes in behaviour that have already occurred in response to greater longevity, and fails to capture the considerable diversity in ageing and the substantial inequality that this contributes to, both within and across age bands.

In reality, the intersection of healthy longevity and an ageing society brings about three distinct market trends. The first is captured in the phrase: 50 is the new 40. To whatever extent 50-year-olds today have the behaviour patterns of 40-year-olds in the past, the economic effect will be an expansion of existing markets to new demographics, rather than the growth of a silver economy.

The second market involves dealing with the needs of an ageing society and the traditional issues that define later life, such as care, medicine, and health. Clearly, the scale of these issues will grow dramatically in response to population shifts, which in turn will prompt new technologies aimed at providing products and services at lower cost and higher quality (eg, ageing in place, telemedicine, and agotech).

The third market will be based around an evergreen sector and will focus on supporting healthy ageing. The estimated value of a 2.2-year increase in life expectancy for Americans aged 50 years or older is \$7.1 trillion.<sup>62</sup> Similarly, the economic value of a slowdown in the rate of biological ageing that improves health and leads to a 1-year increase in life expectancy is worth \$37 trillion.<sup>63</sup> These calculations suggest that although providing services in later life is important, the most valuable products and services will be those that support healthy, productive, longer lives. Crucially, this market will not just be focused on those aged 50 years or older but on the entire life course. It will affect not just the health sector, but also education and a range of other industries (eg, bioscience, pharmaceuticals, food and beverages, and leisure).

### Policy implications

The policy implications of a longevity economy are substantial, although familiar—ie, a focus on health, productivity, and education. However, what is different is the need to focus on these issues at older ages. Although success in these policies will be shown by boosted growth in GDP, both an ageing society and longevity point to a need to broaden the indicators used to evaluate policies.

GDP will remain an important measure of the outputs produced by the economy, but if the working population is decreasing, it is best to look at GDP per capita to understand economic performance and to augment this measure using the economic value of gains arising from health improvements. The value of health gains<sup>64</sup> is substantial and in the USA, was equivalent to around 25% of GDP by the end of the past century, and is now almost the same as measured GDP before 1950.

Importantly, as increasing numbers of people live into old age, and the disease burden shifts to age-related illnesses, it is necessary to focus more on measures of healthy life expectancy than on GDP.

Governments will need to focus policy on certain groups. Longer working careers will be increasingly easy to achieve by those with good health, high skills, and strong finances. For instance, adult education opportunities are disproportionately taken up by those who already have high levels of education. To reduce the risk of widening systemic inequities, government policies will need to target health, education, and employment policies heavily towards those people with the fewest opportunities.

More so than for an ageing society, a longevity economy requires concerted policies to tackle inequality. Inequalities in healthy life expectancy and overall life expectancy are substantial and increasing. Past public health initiatives achieved widespread reductions in health inequalities in childhood and middle age; now the same thing needs to happen in older years. The real truth of ageing is that there is considerable diversity in how people age; from a lifecycle perspective, longer lives have the adverse potential for disadvantages to accumulate over a lifetime.

The other key group to focus on are younger cohorts, for two reasons. First, for lifecycle reasons. The current young are the future old, so it is crucial that governments focus on helping these younger cohorts to age as healthily and productively as possible. Second, for reasons of inter-generational fairness, because the younger generation faces different wage and life expectancies, employment paths, and opportunities to their predecessors. Given the length of life, policies to produce financial sustainability that are intergenerationally fair are required, with generational audits to assess the effect of these policies.

What is striking about most of the policy recommendations around a longevity economy is how well they fit within a standard portfolio of policies aimed at growth and redistribution. At the heart of the longevity economy is the need to extend existing policies towards a new age range and to focus on the diverse circumstances of individuals within that age group. Undoubtedly, ageing and an ageing society raise specific and important issues for governments and the economy. Yet often when looked at closely, the issue of age disappears as a specific issue and policy instead focuses on different groups and specific issues within older age groups. When it comes to the labour market and redistribution, we need a shift away from simple policies conditional on age and instead reflect the diversity and changes in how people are ageing.

Just like Schrodinger's cat, for the longevity economy, the issue of age and its distinctive challenges is both present and not present.

## Conclusion

Longer, healthier lives should be a positive for the economy, and adjusting to longevity offers an opportunity

to offset the negative implications of an ageing society. Previous health improvements have been positive for the economy and the task now is to achieve the same outcome for people in their later years. A wide range of policies is needed to achieve this outcome, but ultimately should focus on boosting employment in those aged 50 years or older, increasing education and training at later ages, and tackling health inequalities in ways that exploit the malleability of ageing.

### Declaration of interests

AJS is a cofounder of the not-for-profit The Longevity Forum, an adviser to Genflow Biosciences, and serves in non-paid roles on a number of advisory boards. In 2021, he received a speaker honoraria from Elsevier for speaking at an event on age diversity.

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