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# *Longevity insurance annuities: potential role in social insurance*[1]

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*Abstract.* The aim of this study is to analyse longevity insurance annuities as a possible addition to social security programmes. The research method is to analyse the strengths and weaknesses of longevity insurance provided by the private sector and by government, and to survey and analyse examples of longevity insurance benefit programmes that countries have already established. Longevity insurance annuities are deferred annuities that start payment at an advanced age at which a substantial proportion of the birth cohort has died. In developed countries, that would mean that these annuities would start for people in their early eighties, but when social security programmes were started in many countries, the age at which longevity insurance annuities would begin was substantially younger. This study finds that originally, public pension programmes in a number of countries were structured as a longevity insurance programme, with roughly 50% of those entering the workforce surviving to receive the benefits because of relatively high benefit eligibility ages. Over time, however, as life expectancy has improved, the benefits these programmes provide have slowly transformed into benefits that most people entering the work force ultimately receive. This paper argues that reintroduction of a longevity insurance benefit as part of public pensions could be an important policy in particular because this benefit is generally not provided by the private sector. These annuities would benefit some older retirees, particularly in countries with modest public pension benefits, but the private sector has problems in providing them, particularly when they have to be provided on a unisex basis. A longevity insurance benefit is desirable in countries that rely on defined contribution pensions, where some workers take their benefits as phased withdrawals, and thus risk outliving their benefits if they live substantially longer than their life expectancy. This paper surveys countries that provide this type of benefit. The addition of these benefits to social security may be particularly desirable

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as part of a reform where other changes being made to maintain solvency are resulting in reduced generosity of benefits.

*Keywords:* longevity, annuities, insurance.
*JEL Codes:* G22, H75, J26.

## 1. Introduction

This study analyses longevity insurance annuities as a possible addition to social security programmes. It does so by analysing longevity insurance annuities in countries that have included those benefits in their social security programmes. It compares public provision of longevity insurance annuities to the possibility of private sector provision.

Longevity insurance annuities are deferred annuities that start payment at an advanced age at which a substantial proportion of the birth cohort has died. These annuities have also been called longevity annuities, longevity income guarantee annuities, and advanced life deferred annuities. Each of the insurance companies that provide them in the United States has their their own name for their product. For example, MassMutual calls its product MassMutual Stable Voyage Fixed Deferred Annuity. The benefits this product provides can be deferred to age 85, but can also be taken substantially earlier.

While all annuities provide longevity insurance through pooling of annuity risks, longevity insurance annuities provide insurance targeted against running out of money at advanced ages. Longevity insurance annuities are deferred annuities, and thus differ from annuities that are purchased at advanced ages, which are more of an income product than an insurance product. Immediate annuities purchased at an advanced age do not benefit from the price reduction due to taking the risk that the purchaser will not live to the age at which they can be received.

As people grow older, especially for those living past their life expectancy and for those relying on employer-provided defined contribution plans, they risk exhausting their sources of income other than their public pension. People with fixed income in retirement may see the real value of those income sources fall in half by their early eighties with inflation rates as low as 3%. People with low public pension benefits who are in their 80s and older are economically vulnerable. At that age, few are able to offset their low benefits by working. They may have used up their retirement assets other than their public pension benefit, and they may have increased expenses due to increased need for medical care or for assistance with aspects of independent living.

Preventing people from falling into poverty as they age is a key goal of public pensions. Longevity insurance is one way to address the income needs of older people who have lived longer than they expected, and have used up their retirement savings other than their public pension benefit. The addition of these benefits to social security may be particularly desirable as part of a reform where other changes made to maintain solvency reduce the generosity of benefits.

In order to assess the possible role of longevity insurance benefits in social security programmes, this paper surveys existing longevity insurance benefit programmes as part of social security programmes around the world. It discusses the Care Allowance and Benefit in Poland, which starts at age 75, and the Age 80 Allowance programme in Ireland and as models for other countries for providing added social insurance for people who are particularly vulnerable because of their advanced age. It also reviews similar programmes in the United Kingdom and Germany, as well as programmes in a number of other countries. The sample of countries studied is a convenience sample, which, to our knowledge, is a fairly complete sample of the countries with such programmes.

## 2. Literature Review

While all annuities provide retirees a degree of insurance against having insufficient income in old age, in recent years the term longevity insurance has been used to refer to a particular type of deferred annuity. Longevity insurance is a deferred annuity that starts at an advanced age, such as 82. Longevity insurance annuities provide insurance against outliving one's assets, but only when that risk becomes substantial at advanced ages [Milevsky 2005].

Unless they purchase an annuity, retirees with employer-provided defined contribution plans in countries with social security systems that do not provide high replacement rates may face the difficult challenge of managing the spend-down of their assets over a retirement period of uncertain length. With a longevity insurance annuity, the planning problem is greatly simplified. Instead of planning for an uncertain period, participants can plan for a fixed period – from the date of their retirement to the date at which they start receiving the longevity insurance benefit, should they survive that long. Longevity insurance changes the planning problem from one with an uncertain end point (date of death) to one with a certain end point (the date at which longevity insurance begins providing benefits).

The age of purchase and the length of the deferral until initial benefit receipt affect the level of benefits provided. For example, longevity insurance annuity purchased in the United States with US$100,000 at age 70 would be expected to provide annual payments starting at age 85 of between $26,000 and $42,000 depending on the interest rate, whether a joint and survivor annuity was chosen and other factors. The longer the deferral period, the greater the benefit, in part because some members of the insured pool will die before receipt of benefits. If the purchase was made instead at age 65 with the starting date at age 85, the $42,000 benefit figure would increase to $51,000 [U.S. Department of the Treasury 2012]. Alternative estimates indicate that an immediate annuity purchased with $100,000 and starting at age 65 would provide $6,950 a year for life, compared to the same purchase with benefits starting at age 85 yielding $63,990 for life [Tergesen 2012]. These benefits would be subject to inflation risk, but some policies allow for lower starting benefits with an automatic escalation. The amount of benefit depends on the interest rates prevailing at the time of purchase, with a risk associated with these annuities being that the purchase occurs at a time when interest rates are low, which would result in low monthly benefits. A strategy to deal with that risk would involve making smaller purchases of longevity insurance annuities over a period of several years.

Horneff et al. [2007] use a simulation model to show that instead of fully annuitizing at retirement, the percentage of one's resources that a person would optimally annuitize increases over time during retirement. People who have some financial resources invested in equity can benefit from the equity premium early in retirement, gradually reducing their investment in equity, and increasing the amount that is annuitized. A longevity insurance benefit does not follow a gradual pattern of increasing the share of assets that is annuitized, but it does capture some of the benefit of that strategy. Horneff et al. [2007] find that most retirees optimally would avoid fully annuitizing until an advanced age, in order to benefit from the equity premium, but by age 80, would fully annuitize their financial wealth, other than wealth used for bequests.

To our knowledge, the United States is the only country where longevity insurance annuities are currently provided by the private sector. While longevity risk can be diversified away for large pools of people if life expectancy is stable, the risk of unexpected increases in life expectancy across the population cannot be diversified away because that risk is positively correlated across people. Life insurance companies have no asset which they can purchase as a hedge against unexpected increases in life expectancy. This problem is particularly important when interest rates are low, because the present value cost of increased benefits at advanced older ages is larger due to the reduced effect of discounting future benefits with low interest rates. Problems with the private sector providing longevity insurance annuities include that adverse selection may be more of an issue than for traditional annuities in that presumably only people with very long subjective life expectancies would purchase longevity insurance annuities.

Requirements in some countries that annuities be provided on a unisex basis pose a greater problem for longevity insurance annuities than traditional annuities, because of the substantial relative difference in life expectancy by gender at older ages. While the absolute difference in life expectancy between men and women narrows with age, the relative difference substantially increases. Life expectancy data for the United States show that at age 20, women have a life expectancy that is 8.3% longer than men, at age 60 it is 14.7% longer than men, and at age 80 it is 18.8% longer than men [Arias 2012]. The greater the relative difference, the greater the disadvantage to males of unisex pricing, and the less likely males would be to buy longevity insurance annuities.

In the United States, gender based longevity insurance can be purchased privately through some life insurance companies, but must be purchased on a unisex basis if purchased directly from a defined contribution pension plan. Metlife [2017] is one of the companies offering gender-based longevity insurance annuities. If this annuity was purchased with a lump sum payment at age 45, it could be received starting at ages 80 or 85 (or earlier). If benefit payments started at age 80, a male beneficiary would receive a benefit 10.4% larger than a female beneficiary due to the longer life expectancy (and greater probability of receipt) of the female beneficiary. The gender difference in benefits is smaller than the gender difference in life expectancy because of the effect of discounting distant benefits. If benefit payments started instead at age 85, the male's benefit would be 13.0% larger than the female's benefit. If instead of being a longevity insurance benefit, the benefit was a deferred annuity starting at age 65, the male's benefit would be 5.2% larger, the shorter deferral period reducing the cumulative female advantage in life expectancy.

These figures suggest that the unisex requirement may be part of the explanation why longevity insurance annuities are not offered currently in the United Kingdom, which has had a strong annuity market and has offered them in the past. When unisex annuities are offered in a voluntary market, there is a tendency for males to not purchases them, with the market price tending toward the price for females.

Webb et al. [2007] argue that a longevity insurance benefit could be appealing to pension participants. They demonstrate that longevity insurance annuities can provide valuable insurance protection at an affordable cost. However, relatively few people have purchased them. One possible explanation may be that people are concerned that they might die before receiving a reasonable amount of their money back, and this concern would be substantially greater for longevity insurance annuities because of their deferred payment start date. That approach to valuing annuities ignores the insurance benefit they provide for people who live to older ages.

Greenwald et al. [2017] survey U.S. workers and retirees concerning their interest in purchasing a longevity insurance annuity. Among workers, 45% indicated that they were very interested or somewhat interested in purchasing a longevity insurance annuity. Among retirees, 5% indicated that they had already purchased a longevity insurance annuity. However, 52% of retirees said they were not at all interested in purchasing such a product, possibly because they had already figured out their retirement income.

Iwry and Turner [2009] discuss adding such a longevity insurance benefit to target date funds as a way of encouraging their purchase through 401(k) plans in the United States. Target date funds are mutual funds that gradually move toward more conservative portfolios as the retirement target date approaches.

Recent contributors to the literature on longevity insurance annuities include Abraham and Harris [2016], who survey the issues, and Ezra [2016]. Ezra [2016] highlights that longevity annuities pool the greatest part of the longevity risk exposure – the part at the oldest ages – when longevity uncertainty is greatest relative to expected future longevity. Scott [2015] finds that for a typical retiree, allocating 10-15% of wealth to a longevity annuity creates spending benefits comparable to allocating 60% of wealth to an immediate annuity. This paper is an extension of an earlier international survey [Turner et al. 2017a].

## 3. The Role of Longevity Insurance Benefits in the Early History of Social Security

Historically, many social security programmes were designed as longevity insurance programmes, even though the term longevity insurance was not used. Over time, they have gradually shifted to being retirement benefit programmes. In the early development of social security, a number of countries initially established social security programmes as longevity insurance benefit programmes, with benefit eligibility ages as high as age 70 at a time when relatively few workers survived to those ages [Chen, Turner 2015].

***Germany***. The original concept of social security under Chancellor Bismarck in Germany was a longevity insurance benefit, though that terminology was not used. The benefit was available at age 70 starting in 1889. While life tables are not available for that year, clearly less than half the population entering the workforce would be alive at that age. It was not until 27 years later (in 1916) that the retirement age was reduced to 65 [U.S. Social Security Administration, n.d.].

***Ireland and the United Kingdom***. When the means-tested old-age pension was introduced in Ireland and Great Britain in 1908, the retirement age was 70. In 1910-1912, life expectancy at birth for a male was age 51 [United Kingdom Office for National Statistics 2015]. When the Basic State Pension was introduced in the United Kingdom in 1946, the benefit eligibility age was 65 for men (60 for women) [Capretta 2007]. When a social insurance based Old Age (Contributory) Pension was introduced in Ireland in 1961 the retirement age was set at 70 and it remained at that age until the 1970s.

***Canada***. Canada first enacted a public pension, which was means tested in 1927, with a benefit eligibility age of 70. The means test was eliminated in 1951, but the eligibility age remained age 70 until 1965, when it was reduced to 65 [Capretta 2007].

***United States***. While U.S. Social Security is now a benefit that most people who enter the workforce survive to receive, it was originally structured like a longevity insurance benefit. In 1940, when benefits were first provided in the United States, the benefit eligibility age was 65. Taking into account that people entered the workforce at earlier ages, from U.S. life tables for 1910 for the population age 18 that year, at age 65, 54% of the population would still be alive [Glover 1921].

***Norway, Iceland and Sweden***. In 1949, the benefit eligibility age was 70 in Norway and 67 in Iceland [Capretta 2007]. When a universal old age pension was established in Sweden in 1913, the eligibility age was 67 [Harrysson, Edebalk 2010].

Over time, two changes have fundamentally altered the nature of the benefits that Social Security provides in the United States and in other countries. First, benefit eligibility ages have been lowered. Second, longevity has increased. With these two changes, social security programmes have transitioned from longevity insurance programmes to programmes providing old-age benefits for a substantial proportion of the population that entered the workforce in their youth.

Thus, in a number of countries, social security old-age benefits were first provided as longevity insurance benefits, providing benefits at an age where a substantial proportion of the population entering the workforce would have died. Social Security has changed into a retirement benefit that most people receive rather than a longevity insurance benefit that is a form of insurance against living to an advanced older age.

## 4. Longevity Insurance Annuities Provided by Government

From an economics perspective, the argument that the government should provide a benefit must be based in part on the conclusion that the private sector cannot provide such a benefit on equally favourable terms. In the United States, individually purchased longevity insurance annuities account for about 1% of the individual purchase annuity market [Panis, Brien 2016].

The government has several advantages over the private sector in providing longevity insurance annuities. First, it is able to limit its liability against the possibility of an unexpected improvement in life expectancy by indexing the age of eligibility for benefit receipt. While the private sector could do this prospectively for new clients, the government is able to do this for people nearing the age of entitlement for the benefit. For example, adjustments to benefit generosity are made at retirement age in Sweden for immediate annuities received at traditional retirement ages. The private sector could hedge against improvements in life expectancy by providing annuities the generosity of which depended in part on changes in life expectancy.

Second, the government has a hedge against the liability to the extent that people work longer (and pay more taxes) due to improvements in health at older ages or due to raising the eligibility age for social security benefits. Currently, no assets exist for the private sector to invest in that provide a full hedge against unexpected improvements in life expectancy. The government would also have increased liabilities for traditional social security benefits due to the improvements in life expectancy, but those could also be dealt with, in principle, by raising the early retirement age and the normal retirement age.

Third, the government does not have to deal with adverse selection because it provides the benefit to a pre-selected group. In the private sector, insurance companies would provide longevity insurance to people who self-select, in part based on their subjective expectation of long life expectancy.

Problems with the provision of longevity insurance annuities in the private sector include that adverse selection may be more of an issue in that they presumably would only be purchased by people with very long subjective life expectancies. Also, potential purchasers may be concerned with the risk of life insurance company insolvency over a long time period. New York Life [2012] expressed the opinion that pure longevity insurance annuities would have limited appeal, but that those annuities combined with another benefit payment feature, in particular a death benefit, would be marketable. While such a benefit would reduce the income provided by the annuity, it would nonetheless provide some longevity insurance benefits.

Longevity insurance benefits can be provided in a number of different ways. They can be provided through government-run social insurance programmes or they can be provided, at least in principle, through the private sector. They can be means tested or available to all older persons. They can be non-contributory benefits or eligibility can be based on having a contributions history. They can be flat benefits or the benefits can be related to earnings or contributions.

## 5. Longevity Insurance Annuities Provided by Government

This section surveys longevity insurance benefits in a selection of countries. Countries are included in the survey based on the criterion that they have a longevity insurance benefit of some type provided by government. The survey is a convenience sample.

Life expectancy differs greatly by country, so the design of longevity insurance benefits in different countries would vary greatly by the age at which they would be available. While the difference between life expectancy at birth and life expectancy at age 20 is relatively small in high-income countries, the difference is substantial in low-income countries due to infant and youth mortality. Life expectancy at age 20 is a better measure for constructing a longevity insurance benefit because that benefit is for people who have worked. The life expectancy at age 20 gives the age at which roughly half of the population entering the workforce at age 20 would have died, and thus that statistic serves as an empirical measure as to whether an old-age benefits programme would be classified as a longevity insurance programme (Table 1).

*Table 1. Life expectancy at age 20 in selected countries as a measure of when a longevity insurance benefit might start, 2015*

| **Country** | **Life expectancy at age 20** | **Country** | **Life expectancy at age 20** |
|---|---|---|---|
| Ireland | 81.9 | China | 77.2 |
| United Kingdom | 81.7 | Nepal | 72.7 |
| Germany | 81.5 | India | 72.6 |
| Kyrgyzstan | 78.1 | Philippines | 71.1 |
| Poland | 78.1 | Zanzibar | 67.1 |
| Vietnam | 78.1 | Lesotho | 60.1 |

Source: World Life Expectancy (2015), WHO data.

In the following international survey, we roughly classify longevity insurance benefits as starting at age 80 or later in OECD countries, age 75 and older in middle income countries, and age 70 and older in lower-income countries. Further, we classify longevity insurance benefits based on the age at which they start and not on other correlates of those benefits, such as whether they are means-tested, whether only social security beneficiaries are eligible, or other issues. The international survey starts with a somewhat detailed explanation of programmes in Ireland, Poland and China, as examples of different types of longevity insurance programmes, followed by less detailed explanations of programmes in other countries.

In the following survey, the number following the name of the country is the life expectancy at age 20 [World Life Expectancy 2015], which is a measure of roughly when workers enter the labour force. Much of the material for this section was obtained by reviewing *Social Security Programs Throughout the World*, which is an online publication of the U.S. Social Security Administration.

***Ireland*** (life expectancy at age 20: 81.9). Longevity insurance benefits are part of the retirement income system in Ireland [Hughes, Turner 2015], China [Chen, Turner 2015], Germany [Chen, Hughes, Turner 2016], and some other countries. Ireland has had a non-contributory social assistance (anti-poverty) pension since 1908 and a contributory social security pension since 1961. Both pensions were originally available at age 70. The contributory social security pension provides flat rate (not earnings-related) pension benefits. The social assistance pension depends on income and assets in old age, and the social security pension depends on previous participation in the labour force. Ireland pays a benefit of about US$550 a year at age 80, called the Age 80 Allowance. That benefit is automatically received by persons receiving Irish social security pensions once they turn age 80. The maximum flat-rate value of the social security pension depends on having an annual average of 48 or more weekly contributions to the social insurance fund during one's working life. A sliding scale of average contributions is used to pay smaller pensions to those with average weekly contributions less than 48 per year. However, the Age 80 Allowance is not reduced.

In Ireland's 1972 national budget, both the social assistance and contributory social security pensions were increased for older pensioners by introducing an age allowance for pensioners age 80 and over. All persons age 80 and older receiving either of those pensions automatically receive the Age 80 Allowance. Thus, the Age 80 Allowance is a social pension that is not separately means tested, but it is also not universal. It excludes some higher-income persons who do not qualify for social assistance because of their income and do not qualify for a social security pension because of not having a sufficient history of work. The particular feature that we are focusing on as a model for other countries is that it starts at age 80. The administration of a social pension that is not means tested is simpler and less costly than for a means-tested pension.

In his 1972 budget speech introducing the new pension benefit, the Irish Minister for Finance [Ireland 1972] George Colley said that the reason for introducing the allowance was that, "*I am especially conscious of the fact that very old persons are often at a disadvantage because of their inability to do things for themselves and shop around for the best value. In recognition of this, all non-contributory* [and contributory] *old age and blind pensioners age 80 and over will receive a further* *increase of 50p per week*". A further justification for the Age 80 Allowance is that data from Ireland show a substantial increase in medical expenses at older ages. Research by Redmond [2015] on the cost of medication by age shows that in 2012 average annual expenditure by those under age 65 was €406 compared with €1,377 for those age 65-69, and €1,772 for those age 75 and over.

While the relationship between the Age 80 Allowance for the social security and social assistance pensions varied in the early years, since 1985 the allowance has been the same for both pensions. The nominal value of the allowance increased considerably in 2006, when it was increased to €10 per week, but it has not increased since then, thus declining in real value for the past decade. The cost of the benefit as a percent of GDP was 0.07% in 2011.

When Ireland introduced the Age 80 Allowance in 1972, that benefit was nearly 10% of the maximum social assistance pension and about 8% of the social security pension, but its relative value has fallen over time. Since 2006, the allowance has stabilized at around 4.5% for both pensions. Those pensions did not increase in value between 2006 and 2015.

***Poland*** (78.1). Poland has a relatively high pension coverage rate compared to other formerly Communist transition economies in Central and Eastern Europe. This result is achieved by a mix of contributory and non-contributory plans. The general social security pension system covers salaried workers and self-employed workers. Farmers are covered by a separate social security scheme, with a small contributory component (with contributions equivalent to 10% of the minimum monthly pension per month). Contributions cover less than 10% of the expenditure on farmers' pensions, and the rest is covered from general government revenues, which means that it is a quasi-social pension for this part of the Polish population. Old-age pensions are paid from ages 61 for women and 66 for men, with those ages falling in October 2017 to 60 for women and 65 for men.

All people age 75 and over receive an additional benefit, financed from the national government budget. There are two types of such benefits. If a person receives a contributory pension (from the general social security plan or the farmers' plan), he or she receives a care benefit (*dodatek pielęgnacyjny*) that is paid on the top of those benefits. If a person is not eligible for a social security pension, he or she receives a care allowance (*zasiłek pielegnacyjny*) paid from the state budget by local community social services, based on the Polish Act on Family Benefits. Initially, the level of both social transfers was similar. Policy developments led to the rising difference in the benefit levels. The care benefit is more generous due to its regular indexation that is guaranteed by law. The care allowance, financed from taxes and not indexed on a regular basis, was kept at the lower level as a part of the fiscal policy and budget savings.

The universal care benefit and allowance in Poland are one of the factors contributing to the lower level of the poverty rate among the population in the age group 75 years and older compared to those age 60 and older. According to Eurostat data [Turner et al. 2017a], the poverty rate for people age 75 and older is the lowest among all age groups. This means that even a relatively small addition to income serves an important goal of reducing poverty at advanced ages.

Access to universal benefits for people age 75 and older reduces the risk of poverty at older ages. It provides an important addition to the income of people in the oldest age group. However, given the rising need for care services with age, it is still seen as insufficient [Szatur-Jaworska 2008].

***China*** (77.2). Though in some cities in China, an old age allowance has been provided for those age 90 or 100, Ningxia province has taken the lead in providing an old age allowance in the whole province and provides monthly benefits for those age 80 and older [Chen, Turner 2015]. In May 2009, Ningxia province first started to provide the old age allowance for those aged 80 and older in rural areas and those aged 80 and older with low income in urban areas. Thus, in urban areas, the old age allowance is a means-tested programme. China does not have a unified national social security programme – programme features vary across the provinces. Ningxia province is the first one to provide this benefit. The lowest benefit level regulated by provincial government is as follows: those age 80-89 receive 300 yuan (¥) per month; those age 90+ receive 350¥ per month. County or district governments can increase the benefit level according to their financial ability. In Shenzhen city (a developed city in China and the first city to develop a market economy at the end of the 1980s) of Guangdong province, the benefit level is as follows: those age 80-89 receive 200¥ per month; those age 90-99 receive 300¥ per month; those age 100+ receive 500¥ per month.

Since 2009, more cities have started to establish old-age allowance programmes in China. In 2006, only 2.34 million people were receiving an old-age allowance, but by the end of 2010, 5.76 million people received the old-age allowance. From 2006 to 2010, the percentage of the population age 80 and older receiving old-age allowance benefits increased from 12.9% to 27.0%. In 2011, 14 provinces started to provide the old age allowance. However, in general, the old age allowance programme is not universal for those age 80 and older in China.

In most cities, the old age allowance is means tested and provides benefits to those with low income. In Ningxia Province, only those age 80 and older with per capita income of family members lower than 150% of the minimum living standard are eligible for old-age allowance. In Heilongjiang province and Jilin province, those age 80 to 89 with income lower than the minimum living standard are eligible for the old age allowance [People's News 2012]. For those age 90 and older, no means test is required. All eligible old age persons can receive 100¥ (US$16) per month. Thus, the old age allowance programmes in these two provinces are means tested for those age 80 to 89, while being universal for those age 90 and older [People's News 2012]. In Shenzhen city, the old age allowance is not means-tested and is universal for those satisfying the age requirement.

***United Kingdom*** (81.7). Any State pension in the United Kingdom is increased by the tiny amount of £0.25 (€0.35) per week at age 80 [Europa, 2016]. The benefit has not been increased since it was introduced in 1971, suggesting that there is little political support for the benefit. The United Kingdom also provides the Over 80 Pension, which is a means-tested pension for those age 80 or older. It can also be paid as a top-up amount to a person's State Pension when that person reaches age 80, if he or she receives the State Pension at a lower rate than £71.50 or does not receive the basic state pension. Relatively few persons qualify for this benefit, however, because it has a low income eligibility cut-off point.

***Germany*** (81.5). Riester pensions in Germany are voluntary defined contribution plans that were enabled by a pension reform taking effect in 2002, and named after the Labour Minister responsible for establishing them. They require that at retirement the participant purchase an annuity that begins payment by age 85 [Börsch-Supan, Wilke 2005]. Thus, the Riester pension can be used as a longevity insurance annuity, but it is not specifically designed that way because benefits can start at considerably earlier ages.

***Vietnam*** (78.1). In Vietnam, a non-contributory pension programme was implemented in 2004 [Long 2011]. Initially, it provided a benefit of 65,000 dong (US$4.20) each month to persons age 90 or older who did not receive any contributory pension benefits. Over time, eligibility ages were reduced and the benefit amounts have increased. In 2007, the minimum eligibility age declined to 85 and to 80 in 2010. Under current law, this old-age social pension (social assistance) is available to those age 60 to 79 who are "*needy and living alone without family support*" and to those age 80 or older and not receiving any contributory pension [U.S. Social Security Administration 2015b].

The monthly benefit amount varies by age and health-related circumstances (and may be higher in provinces with greater fiscal capacity) as follows: 180,000 dong (US$7.93) to those age 60 to 79 if needy and living alone without family support or older than age 80; 270,000 dong (US$11.90) if age 60 to 79, needy, disabled and living alone without family support or older than age 80, needy, and living alone without family support; 360,000 dong (US$15.87) if older than age 80, needy, disabled and living alone without family support. According to various sources cited by the Asian Development Bank, more than two-thirds of eligible individuals had not received a benefit nor had many provinces implemented the programme in recent years [Long 2011].

***Nepal*** (72.7). Although social insurance coverage provided through the National Provident Fund is limited, an old-age allowance provides social assistance to an estimated 682,000 individuals who received the benefit in 2010. In December 1994, the government introduced a universal social pension for all Nepalis 75 years of age or older. Initial implementation of the programme aimed to support the age and their family-based support systems by providing cash payments of 100 rupees (US$2.21 in 1994$) per month to persons 75 years or older. In 1996, the government increased the benefit payable to people 100 years of age or older. In 2011, the programme offered a monthly benefit of 500 rupees (around US$6) to all persons age 70 or older[3] (on reaching their 100th birthday, the benefit for

[3] The benefit was also available to members of all lower-caste groups (referred to as Dalits) and residents of the Karnali zone beginning with their 60th birthday.

beneficiaries increases to 1,000 rupees). The programme is funded through general taxation [Samson 2012].

The allowance provides national coverage, with some geographic variability in take-up rates. In most areas, the government aims to pay benefits every 4 months, equal to 2,000 rupees (US$18.32) per payment. In remote rural areas with limited access to village development officers, however, the government struggles to make payments once a year, for the full entitlement of 6,000 rupees (US$54.95) annually. When the government first implemented this programme, some 180,000 people were 75 years of age or older, representing an estimated 0.8% of the country's population. By 2011, this group had grown to around 380,000, representing 1.3% of total population. In absolute terms, the older population had more than doubled, and the population share had grown by about 60%. In 2011, the population age 70 years or older was about 757,000 people, representing 2.6% of the total population. The Senior Citizens' Allowance covered an estimated 640,119 older people in 2010, a small decrease from 646,461 beneficiaries in 2009 [Samson 2012]. Currently, the monthly benefit still equals 500 rupees, but 1,000 rupees are paid to members of certain ethnic groups [U.S. Social Security Administration 2015a].

***Kyrgyzstan*** (73.1). A pension supplement is paid to person age 80 or older. The benefit is also paid to World War II veterans, Chernobyl disaster workers, and certain other groups [U.S. Social Security Administration 2014].

***India*** (72.6). The city of Delhi provides a benefits programme for low-income seniors starting at age 60, with a special supplement starting at age 70. In 2017, people age 60-69 receive a benefit of Rs 2,000 a month, while those age 70 and older receive a benefit of Rs 2,500 a month [Hindustan Times 2017].

***Philippines*** (71.1). The Philippines has a programme for low-income seniors that pays benefits starting at age 77 [Ronda 2015; Philnewsph 2017]. The government has sought greater funding for the programme so that it can extend the benefits to seniors who are younger than age 77. The programme began in 2011.

***Zanzibar*** (67.1). Zanzibar, a semi-autonomous country (in a union with mainland Tanzania), has recently launched a pilot programme that offers both men and women age 70 or older 20,000 shillings (US$9.18) each month [Rebela 2016]. The universal programme was launched ahead of what is planned to be a similar universal pension programme in Tanzania.

***Lesotho*** (60.1). The old-age pension, which started in 2004, begins payment at age 70 [U.S. Social Security Administration 2015a]. All persons age 70 and older are entitled to a monthly benefit equivalent to about US$40. The benefit is non-contributory, meaning that eligibility is not based on the person having made contributions. The cost of the benefit is equal to 1.7% of GDP [Ortiz, Schmitt, De 2017]. Lesotho provides an example of a low-income country that is able to provide old-age benefits by providing those benefits as a longevity insurance benefit, starting at a relatively old age, given the life expectancy in the country.

## 6. Proposals for Longevity Insurance Benefits in Countries with Defined Contribution Social Security Programmes

Several countries with defined contribution social security programmes are currently considering adding longevity insurance benefits to their programmes. These countries include Chile, El Salvador and Peru [FIAP 2017]. People in these countries risk outliving their resources, particularly if they take their benefits as programmed withdrawals. In El Salvador, a proposal calls for a modification to programmed withdrawals, so that a deferred annuity would be provided starting at an advanced age after 20 years of receipt of programmed withdrawals. When fully phased in, the longevity insurance benefit would be financed by a tax of 2% of wages. This cost is higher than in some other programmes because the longevity insurance benefit would not be a supplemental benefit. Rather it would be the entire social security benefit provided at advanced older ages.

In Chile, a criticism of the proposal for longevity insurance benefits is that lower-income workers have lower life expectancy than higher-income workers, and thus the proposal is regressive, favouring higher income workers. This criticism is offset somewhat by recognizing that the relationship between income and life expectancy is usually calculated within a gender group, and applies both to males and females within their gender groups. The relationship is weakened when considering the entire population because women have lower income than men on average, while at the same time having longer life expectancy.

The proposal for longevity insurance annuities in Chile has the annuities provided through a countrywide programme rather than through life insurance companies. Life insurance companies impose high reserving margins (the funds required to back up the insurance) to make sure they can cover the possibility of unexpected improvements in life expectancy. These margins result in a low value of longevity insurance benefits. The provision of longevity insurance benefits in Chile, starting somewhere between age 82 and 85, would raise the mandatory contribution rate from 10% to 12% [FIAP 2017].

## 7. Comparison Across Countries

We compare characteristics by country of longevity insurance for older people. Poland, Ireland, and the United Kingdom have provided support for a long time for those age 75 or 80 under social insurance and social assistance programmes. China (Ningxia and other provinces), Vietnam, Nepal, Kyrgyzstan, the Philippines, Zanzibar and Lesotho provide support only under social assistance. Germany has provided support since 2002 when Riester individual DC pensions were marketed by private insurance companies. Recently, proposals have been made in Chile, Peru and El Salvador for the introduction of longevity insurance benefits.

The age of eligibility for a pension that we categorize as a longevity insurance pension varies across countries depending on the life expectancy in the country.

The age of eligibility in Nepal, Zanzibar and Lesotho is 70. In Poland, the age is 75, and in the Philippines, it is 77. In Ireland, the United Kingdom, China (Ningxia), Vietnam and Kyrgyzstan it is 80, and there is an increase in the allowance in Ningxia at age 90 and in Nepal at age 100. Contributors to private Riester pensions in Germany can claim their longevity annuity at age 85 or earlier.

The value of longevity insurance in Ireland is the same, €43.33 per month (US$46.36), whether it is paid under social insurance or social assistance programmes. In Poland, it is about one-third higher under social insurance than social assistance, €50 v €37 ($53.50 v $39.59) per month. The value of the age 80 supplement for anyone in the United Kingdom who qualifies for a State pension is very modest amounting to less than 2% of the basic State pension. However, in both jurisdictions there is a means tested pension for anyone whose income is less than 50% of the basic State pension. The value of the payment in Germany is not uniform, as it would probably be under public programmes for old-age pensions. The payment is provided by private insurance companies, and it varies according to the capital value of pension savings.

The cost of longevity insurance depends, among other things, on what level of benefits is offered. For most countries where the cost has been estimated, it is quite modest and would not impose a noticeable burden on employers and employees. In Ireland, the current cost amounts to 0.07% of GNP, and it would double to 0.16% in 2046, as the proportion of older people age 80 years and over increases faster than the people age 65 years and over.

## 8. Conclusions

Longevity insurance annuities are deferred annuities that start at an advanced age. With current life expectancy, in developed countries they generally start for persons in their eighties, but in low and middle-income countries, they would start at ages 70 or 75. While a small number of countries include longevity insurance annuities in their social security programmes, most do not. This study investigates whether a longevity insurance annuity would be a desirable addition to a social security programme. A longevity insurance annuity is desirable in countries, such as the United States (not having such a programme) and Ireland (having such a programme), where social insurance old-age benefits are relatively modest, and people risk running out of other sources of retirement income at advanced older ages. In low and middle-income countries with low effective social security coverage rates, longevity insurance benefits would be a targeted, cost-effective way of providing social security benefits for people at advanced older ages. A few countries already have established such programmes.

It appears that the United States may be the only country that currently provides longevity insurance annuities through the private sector. Because of problems that private sector insurance companies have in providing these annuities, and because of the valuable insurance these annuities provide, it is desirable for governments to consider adding these annuities to their social security benefit programmes.

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## References

Abraham K. G., Harris B. H., 2016, *The market for longevity annuities*, "Journal of Retirement", 3(4), pp.12-27, http://www.iijournals.com/doi/abs/10.3905/jor.2016.3.4.012?journalCode=jor.

Blake D., Turner J. A., 2014, *Longevity insurance annuities: Lessons from the United Kingdom*, "Benefits Quarterly", 1, pp. 39-47.

Börsch-Supan A. H., Wilke C. W., 2005, *Reforming the German public pension system*. http://www.rand.org/labor/aging/rsi/rsi_papers/2006_axel1.pdf.

Capretta J. C., 2007, *Global aging and the sustainability of public pension systems: an assessment of reform efforts in twelve developed countries. A Report of the Aging Vulnerability Index Project*. Washington, DC: Center for Strategic & International Studies. http://csis.org/files/media/csis/pubs/pension_profile.pdf.

Chen T., Hughes G., Turner J. A., 2016, *Longevity insurance benefits for Social Security: International experience*, "Benefits Quarterly", 32(2), pp. 43-53.

Chen T., Turner J. A., 2015, Longevity insurance annuities: China adopts a benefit innovation from the past, "International Social Security Review", 68(2), pp. 27-41.

Central Intelligence Agency (CIA), 2016, Country Comparison: Life Expectancy at Birth, "The World Factbook", https://www.cia.gov/library/publications/the-world-factbook/rankorder/2102rank.html.

Dugan A., 2014, *Retirement remains Americans' top financial worry*. Gallup, April 22, 2014. http://www.gallup.com/poll/168626/retirement-remains-americans-top-financial-worry.aspx.

Expert Committee on the Future of the Québec Retirement System, 2013, *Innovating for a sustainable retirement system: a social contract to strengthen the retirement security of all Québec workers*, http://www.rrq.gouv.qc.ca/SiteCollectionDocuments/www.rrq.gouv.qc/Anglais/publications/rapport_comite/rapport.pdf.

Ezra D., 2016, *Most people need longevity insurance rather than an immediate annuity*, "Financial Analysts Journal", 72(2), pp. 23-29, http://www.cfapubs.org/doi/pdf/10.2469/faj.v72.n2.3.

Glover J. W., 1921, *United States life tables: 1890, 1901, 1910, and 1901-1910*, U.S. Bureau of the Census, U.S. Government Printing Office. http://www.cdc.gov/nchs/data/lifetables/life1890-1910.pdf.

Harrysson L., Edebalk P. G., 2010, *Employers and pension reform in Sweden from war to war*, Lunds University Working Paper, 4, https://lucris.lub.lu.se/ws/files/3553576/1691648.

Hindustan Times, 2017, *Delhi Govt Increases Monthly Pension of Elderly, Widows and Disabled*, January 6. http://www.hindustantimes.com/delhi/delhi-govt-increases-monthly-pension-of-elderly-widows-and-disabled/story-GM5KeCQHxdBgk62EyQ5CfK.html.

Horneff V., Maurer R., Mitchell O. S., 2016. *Putting the pension back in 401(k) plans: Optimal versus default longevity income annuities*, SAFE Working Paper 150, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2853430.

Hughes G., Turner J. A., 2015. *Demographic change and longevity insurance benefits for public pension reform* [in:] Szczepański M. (Ed.), Demographic Change and Public Pensions, Poznań University Press, Poznań.

Ireland, 1972, *Financial Statement, Budget 1972*. http://oireachtasdebates.oireachtas.ie/debates%20authoring/debateswebpack.nsf/takes/dail1972041900020?opendocument.

Iwry J. M., Turner J. A., 2009, *Automatic annuitization: New behavioral strategies for expanding lifetime income in 401(k)s* [in:] Gale W.G., Iwry J. M., John D.C., Walker L. (Eds.), Automatic: Changing the Way America Saves, Washington, DC: Brookings Institution Press, pp. 151-172.

Long T. L., 2011, *Viet Nam: Pension system overview and reform directions*, [in:] Park D. (Ed.), Pension Systems and Old-Age Income Support in East and Southeast Asia: Overview and reform directions, Metro Manila, Philippines: Asian Development Bank, pp. 203-221.

Milevsky M. A, 2005, *Real longevity insurance with a deductible: Introduction to advanced-life delayed annuities (ALDA)*, “North American Actuarial Journal”, 9(4), pp. 109-122.

New York Life, 2012, *Comment letter on the proposed longevity annuity contract regulation*.

Organisation for Economic Co-operation and Development (OECD), 2016, *Net pension replacement rates*, https://data.oecd.org/pension/net-pension-replacement-rates.htm.

Ortiz I., Schmitt V., Loveleen D. (Eds.), 2017, *Social Protection Floors: Volume 1: Universal Schemes.* International Labour Organisation, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2895420.

Panis C. W. A., Brien M. J., 2016, *Innovations and trends in annuities: Qualifying Longevity Annuity Contracts (QLACs)*, Advanced Analytical Consulting Group and Deloitte. October 24. https://www.dol.gov/sites/default/files/ebsa/researchers/analysis/retirement/innovations-and-trends-in-annuities.pdf.

People’s News, 2012, *Nine million people age 80 and older receiving Old Age Allowance in China*, http://politics.people.com.cn/n/2012/0808/c1001-18693477-1.html.

Rebela M., 2016, *Zanzibar pension scheme timely for poor elderly*, The Citizen (November 23), http://www.thecitizen.co.tz/News/Zanzibar-pension-scheme-timely-for-poor-elderly--VIDEO-/1840340-3460922-t823emz/index.html.

Redmond P., 2015, *Spending on medication increases with age*, http://www.publicpolicy.ie/spending-on-medication-increases-with-age/.

Ronda, R. A., 2015, *DSWD wants bigger budget for indigent seniors’ pension*, The Philippine Star, updated September 30.

Russell H., Maitre B., Nolan B., 2010. *Monitoring poverty trends in Ireland 2004-2007: Key Issues for Children, People of Working Age and Older People*, Dublin: Economic and Social Research Institute, Research Series 17. https://www.esri.ie/news/monitoring-poverty-trends-in-ireland-2004-2007/

Samson M., 2012, *Nepal’s Senior Citizens’ Allowance: a Model of Universalism in a Low-Income Country Context*, [in:] Handayani S.W., Babajanian B. (Eds.), Social Protection for Older Persons: Social Pensions in Asia, Mandaluyong City, Philippines: Asian Development Bank, 2012, pp. 214-246.

Scott J. S., Watson J. G., Hu W. Y., 2007, *Efficient annuitization: Optimal strategies for hedging mortality risk*. Pension Research Council Working Paper 2007-09.

Szatur-Jaworska B., 2008, *Bezpieczeństwo socjalne – wybrane pieniężne świadczenia społeczne. [Social safety – selected cash social benefits]* [in:] Szatur-Jaworska B. (Ed.) Stan przestrzegania praw osób starszych w Polsce. Analiza i rekomendacje działań. [The status of respecting the rights of the older people in Poland. Analysis and recommendations for actions] Biuletyn RPO Materiały 65, Warszawa.

Tergesen, A., 2012, *How to create a pension (with a few catches)*, Personal Finance, Wall Street Journal, April 9. http://www.wsj.com/articles/SB10001424052970204571404577253853314354494

Turner J. A., 2013, *Providing longevity insurance annuities: a comparison of the private sector versus Social Security*, "The Journal of Retirement", 1(2), pp. 125-131, http://www.iijournals.com/doi/abs/10.3905/jor.2013.1.2.125.

Turner J. A., Hughes G., Chłoń-Domińczak A. Rajnes, D. M., 2017, *Improving Pension Income and Reducing Poverty at Advanced Older Ages: Longevity Insurance Benefits in Ireland and Poland as Models for the United States*, "The Journal of Retirement" (forthcoming).

U.K. Office for National Statistics, 2015, English Life Tables No. 17, 2010-2012. Statistical Bulletin, September 1. http://www.ons.gov.uk/ons/rel/lifetables/decennial-life-tables/english-life-tables--no-17--2010-12/stb-elt17.html.

U.S. Department of the Treasury, 2012, *Longevity Annuity Contracts*, Federal Register 77 #23, February 3, pp. 5443-5454, http://www.gpo.gov/fdsys/pkg/FR-2012-02-03/pdf/2012-2340.pdf.

U.S. Social Security Administration, 2014, *Kyrygystan. Social Security Programs Throughout the World: Asia and the Pacific, 2014*, https://www.ssa.gov/policy/docs/progdesc/ssptw/2014-2015/asia/kyrgyzstan.html.

U.S. Social Security Administration, 2015a, *Lesotho. Social Security Programs Throughout the World: Africa, 2015*, https://www.ssa.gov/policy/docs/progdesc/ssptw/2014-2015/africa/lesotho.pdf.

U.S. Social Security Administration, 2015b, *Vietnam. Social Security Programs Throughout the World: Asia and the Pacific, 2015*. https://www.ssa.gov/policy/docs/progdesc/ssptw/2014-2015/asia/index.html.

U.S. Social Security Administration, 2016, *The Isle of Man. Social Security Programs Throughout the World: Europe, 2016*, https://www.ssa.gov/policy/docs/progdesc/ssptw/2016-2017/europe/isle-of-man.pdf.

U.S. Social Security Administration, 2016a, *Proposals affecting trust fund solvency*, Actuarial Publications, https://www.ssa.gov/oact/solvency/.

U.S. Social Security Administration, 2016b, *Representative Ribble: Letter to the Honorable Reid Ribble*. https://www.ssa.gov/OACT/solvency/RRibble_20160713.pdf.

Vincent G. K., Velkoff V. A. (2010). *The next four decades. The older population in the United States: 2010*, Current Population Reports, P25-1128, U.S. Census Bureau, May. https://www.census.gov/prod/2010pubs/p25-1138.pdf.

Webb A., Gong G., Sun W., 2007, *an annuity people might actually buy*, Center for Retirement Research at Boston College, Issue in Brief No. 7-10, July. http://crr.bc.edu/briefs/an-annuity-people-might-actually-buy/.

World Life Expectancy, 2015, *Life Expectancy by Age*, http://www.worldlifeexpectancy.com/your-life-expectancy-by-age.