

연금, 적립시장에서 인출시장으로

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Overview

1. UK annuity market
2. Longevity risk
3. Deferred annuities (longevity annuities)
4. Implementation in Korea

Next,

1. UK annuity market

UK annuity market

“With £100,000 from their pension pot, a healthy 65-year-old could now buy an annual income worth £7,465, compared with just £4,950 three years ago — up over 50 per cent, based on data from annuity broker Retirement Line.”

31 Aug 2023, *Financial Times*.

“In October (2022), a 65-year-old using £100,000 to buy an annuity could have found deals paying £7,586, compared with £6,781 today, ... However, ... higher than the £4,626 ... in January 2021.”

“Hargreaves Lansdown says a 65-year-old with a £100,000 pension would get a starting income of £4,316 from an RPI-linked annuity compared with £6,781 from a level one.”

“After years in the retirement planning wilderness, annuities — guaranteed incomes for life — are back in the limelight, due to rising interest rates.”

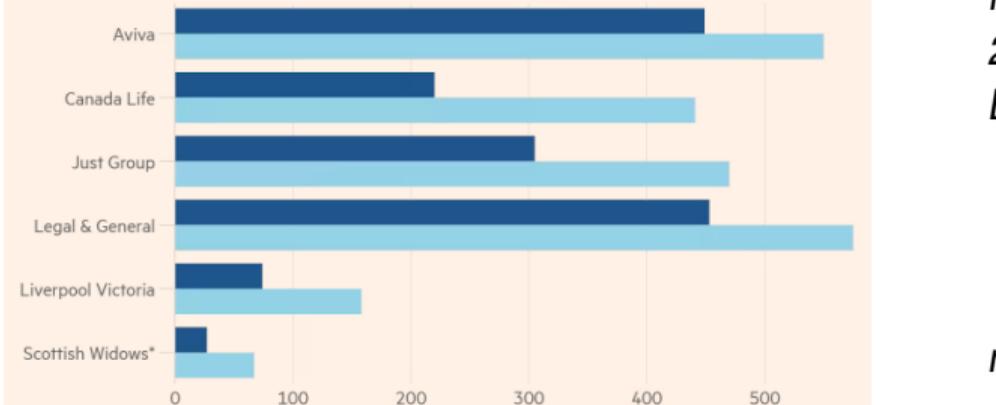
02 Feb 2024, *Financial Times*.

UK annuity market

Providers have reported an uptick in annuity sales as rates improved

Annuity sales (£mn)

■ H1 2022 ■ H1 2023



*Figures include bulk annuities
Source: Companies, FT Research
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“Some £2.3bn of lifetime annuities were sold in the first half of 2023, up from £1.7bn for the same period in 2022, according to the Association of British Insurers.”

05 Sep 2023, *Financial Times*.

“2023 was a milestone year for annuity sales which totalled £5.2 billion, ABI data shows”

16 Feb 2024, *Financial Times*.

These sales figures include both lifetime annuities and fixed-term products, giving an income for a set period such as 10 years.”, 25 Aug 2023, *Financial Times*

UK pension scheme direction

Workplace pension (퇴직연금)에 대한 부분이나 사적연금 전반에 대한 방향으로 이해할 수 있음

How we can provide better security for members in retirement?

- 1 Boosting returns and managing risk
- 2 Reducing complex financial decisions
- 3 Supporting awareness and informed decisions
- 4 Inclusiveness and equality

After 15' pension freedom and 12'- 18' automatic enrolment, government focus is on

- A pot for life - introducing a lifetime provider for automatic consolidation ($\leq 1,000$)
- Collective defined contribution in accumulation and also in decumulation
- Pension dashboard programme
- Value for money framework

Source: Department for Work & Pensions, "Government response to ending the proliferation of deferred small pots", Updated 22 November 2023.

UK annuity market vs. Korea annuity market

- 금리상승으로 종신연금의 가격이 하락하여 연금소비자의 관심이 급격하게 늘어남
⇒ 한국은 인출시장보다는 적립시장 위주; 인출상품도 공시이율에 영향을 받아 조정속도가 느림.
- 대형 생명보험사를 중심으로 연금보험료 조종이 빠르게 일어났고 매출도 급격히 증가함
⇒ Annuity Prices are more sensitive to an increase than to a decrease in rates (Charupat et al., 2016).
⇒ 공시이율에 의존적인 한국시장은 보험료의 이자율 민감도가 낮음
- DB 퇴직연금 시장을 통한 bulk annuity (buyout, buy-in)에 대한 수요도 크게 증가함
⇒ 한국의 DB 급여구조상 bulk annuity 사업이 형성될 수 없음
⇒ 월적립식 사적연금 및 연금보험 매출에 의존적인 한국의 생명보험사와 대조적임
- 종신연금 상품도 일반 종신연금 외, enhanced annuity와 inflation-linked annuity도 구매가능함
⇒ 한국의 생명보험사는 적립시장에서는 타업권에 경쟁력이 밀리고 인출상품도 다양하지 않음
- Deferred income annuity (longevity annuity) 구현에 관심이 있으나 상대적으로 낮은 보험료 중 longevity risk에 대비해야 부분이 상당이어서 매출과 수익성이 낮은 것으로 보고 있음

A message

The limitation of annuity markets and lack of product information significantly increase the welfare costs.

Koijen et al. (2011)

Next,

2. Longevity risk

- Individuals
- Life insurers or annuity providers

Longevity risk

- Longevity risk is the possibility of an individual outliving his financial resources.
- Can be weakly defined, the probability that an individual is not able to pay his essential medical and health cares.

How can individuals reduce or eliminate the longevity risk?

- 1 Higher salary, more savings, and greater investment returns - not always achievable
- 2 With pension schemes, annuities, and insurance products
 - Diversified investment portfolios + guarantees + tax exemption/relief
 - Annuities - immediate, deferred, inflation-protected, LTC, home equity release
 - They all require good strategies, such as timing, allocation, and preferences

적절한 시기에 적절한 양의 연금을 계속하여 구매하는 것이 이상적임. 연금의 형태 또한 보험에 한정하지 않고 부동산, 주식 등으로 넓힐 수 있음. 적절한 시기는 선호, 습관, 성별, 나이, 자산의 형태, 크기와 배분, 시장상황, 구매가능한 연금상품 등에 따라 달라짐.

Longevity risk - a behavioural finding

The young underestimates survival and the old overestimates survival (Heimer et al., 2019).

	e_{20}	e_{40}	e_{60}	e_{80}	e_{85}	e_{90}	e_{95}	e_{100}
Objective	57.51	39.14	22.03	8.47	5.94	3.95	2.56	1.78
Subjective (p_x -scaling)	50.29	33.24	19.36	8.23	6.18	4.45	3.16	2.13
Subjective (μ_x -scaling)	52.62	34.06	19.22	7.72	5.69	4.05	2.78	1.82

Table 2: Life expectancy at different ages with objective mortality and subjective mortality (under both p_x - and μ_x -scaling)

Source: Jeong et al. (2023); SSA 2019 male; 2019 Survey of Consumer Finance.

Longevity risk - life insurers or annuity providers

Longevity risk is the risk that policyholders, pension scheme members or other underlying beneficiaries, in aggregate, live longer than expected.

Greater longevity risk \Rightarrow Higher SCR and MCR \Rightarrow More quality assets required

보험사는 자본이 무한하지 않기 때문에 Risk Budgeting을 해야 하는 데, Deferred Income Annuity or Longevity Annuity의 경우 낮은 보험료 대비 높은 장수위험을 감당해야함.
이는 사업의 수익성에도 좋지 않은 영향을 미칠 수 있음.

이런 이유로, 개인의 장수위험 관리하는 데 DIA or LA을 활용하는 것을 학계나 정부에서 권장함에도 불구하고, 보험사가 관련 상품이나 사업을 시행하는 데 어려움이 있음.

Next,

3. Deferred annuities (longevity annuities)

- Supporting academic papers
- Longevity risk sharing
- Equity-linked

Supporting academic papers

Deferred annuity or deferred income annuity or longevity annuity을 활용했을 때, 개인의 생애주기에 걸쳐 효용이 증대되거나 소비가 증가한다는 학술자료는 상당히 많음.

※ 여기서 Annuity은 irreversible contract으로 해지가 가능하지 않고 사망해지에 대한 급여도 없음.

Accumulation phase

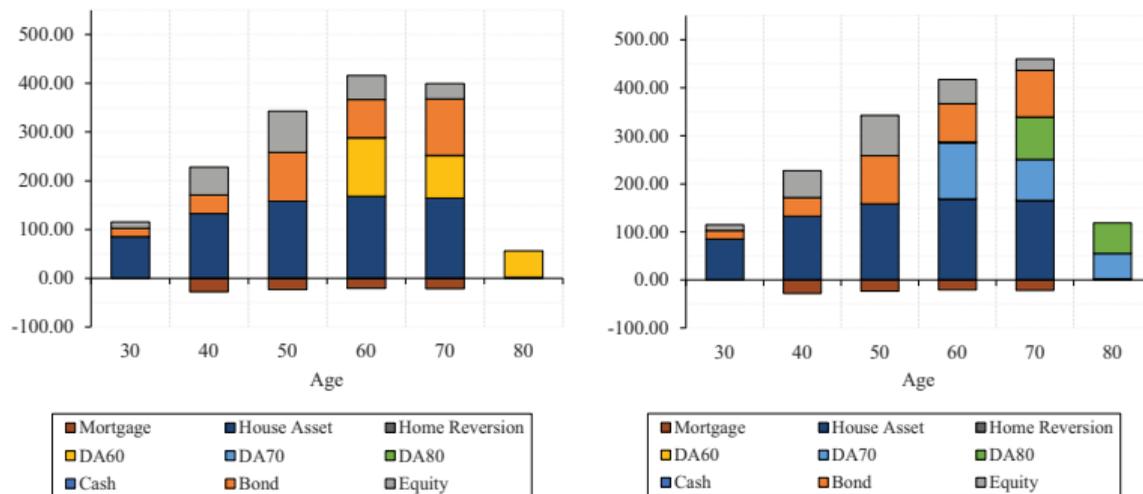
The optimal strategy is to start to purchase deferred annuities early (from age 40) and to keep purchasing them over time up to about 80% of the final portfolio at retirement (Scott, 2008; Maurer et al., 2013; Horneff et al., 2010; Huang et al., 2016; Owadally et al., 2021a,b).

Decumulation phase

Purchasing deferred income annuities can enhance welfare for all sex and education groups (Horneff et al., 2020, 2023; Chai et al., 2011; Jang et al., 2022; Chen et al., 2023)

Jang et al. (2022) - optimal asset allocations with deferred annuities

Deferred income annuity (longevity annuity) has a significant role in optimal lifetime investments.



(a) Case A: DA(-), HR(-)

(b) Case C: DA(+), HR(-)

Figure: Average wealth composition (x\$1,000) over lifetime in terms of financial assets, mortgage, home reversion, and annuities (DA60, DA70, DA80 start paying out at ages 60, 70, 80 resp.) for cases A and C. Abbreviations: DA = Deferred annuities. HR = Home reversion. (+) = available. (-) = not available.

Denuit et al. (2011), Longevity risk sharing

Suggest that the annuity benefit at time k is adjusted by the factor

$$i_{t_0+k} = \frac{{}_k p_{x_0}^{ref}(t_0)}{{}_k p_{x_0}^{obs}(t_0)}.$$

The annuity benefits depend on the “expected/actual” ratio of reference population data.

⇒ Longevity risk partly transferred to policyholders; i.e., systemic risk ↓.

통계청장공시 Δ 기대여명 $_{+\alpha}$ 활용한 조정도 고려 ⇒ 보험사가 감당해야하는 장수위험이 크게 줄어듦.

Equity-linked

Horneff et al. (2023) and Maurer et al. (2013) shows how investment-linked deferred annuities can enhance welfare.

Table 2: Welfare Analysis I: Alternative Ways to Annuitize Defined Contribution Assets, Fixed vs Variable DIA and Delay Claiming (Reference case Setting 1, Figure 3)

Sex	Education	Claim @66		Claim @67
		Fixed DIA	Variable DIA	w/o DIA
Female	Coll+	38,804	41,305	20,594
	HS	14,528	16,264	11,560
	<HS	3,410	4,295	7,725
Male	Coll+	46,870	50,207	26,809
	HS	16,215	18,635	14,767
	<HS	6,360	7,939	10,641

Note: The reference case in this table is “claim @66, w/o DIA.” The values given refer to the additional amounts that must be paid into the DC plan that would yield the same utility to the individual who claims her Social Security benefits at age 66 and has no access to a DIA, versus the three settings indicated. Both DIAs (columns 1 and 2) start payouts from age 85, while the Variable DIA uses a 50/50 stock bond portfolio. In column 3, the individual delays claiming Social Security to age 67, and withdraws from her DC plan to finance consumption that year. Source: Authors’ calculations.

Next,

4. Implementation in Korea

Are they all available in Korean annuity market?

한국에서 아래와 같은 연금상품을 구매할 수 있을 까요?

Option	Yearly Income
Single life annuity with no increases or guaranteed period, paid annually in arrears	£6,747
Single life annuity with no increases or guaranteed period, paid monthly in arrears	£6,531
Single life annuity with no increases, paid monthly in arrears, including a 30-year guaranteed period	£5,929
Single life annuity increasing by 3% each year, with no guaranteed period, paid monthly in arrears	£4,468
Single life annuity with annual increases in line with inflation, with no guarantee period, paid monthly in arrears	£3,801
Annuity paid monthly in arrears with a 100% spouse's pension for a healthy 57-year old spouse, no increases or guaranteed period	£5,729

This is based on a healthy 60-year old Londoner with pensions savings of £100,000.

Source: 2023 Annuity Guide, Fidelity International

Implementation in Korea

인출상품을 다양화(특히 연금소득 및 장수위험 보장이 강화된)하고 생보사의 역할을 강화하기 위해서는

- 1 상품개발을 제약하는 제도는 없애거나 개선되어야 합니다.
- 2 새로운 이율체계를 만들어 equity-index annuity 운영을 일반계정에서 가능하게 해야 합니다.
- 3 장수위험을 보장하는 보험상품에 대한 세재혜택 및 지원을 늘려야 합니다.
- 4 모집수수료 등의 정보를 투명하게 전달하고 모집수수료가 없는 채널도 만들어야 합니다.
- 5 노후소득 보장 및 장수위험 관리에 대한 연금투자 및 연금화에 대한 교육을 확대해야 합니다.
- 6 생애주기 연금투자 및 연금화 행태를 모니터링하고 이해를 넓힐 수 있도록 기초연구 및 후속연구에 대한 규모있는 지원이 필요합니다.

References I

- Chai, J., Horneff, W., Maurer, R., & Mitchell, O. S. (2011). Optimal Portfolio Choice over the Life Cycle with Flexible Work, Endogenous Retirement, and Lifetime Payouts*. *Review of Finance*, 15, 875–907.
- Charupat, N., Kamstra, M. J., & Milevsky, M. A. (2016). The Sluggish and Asymmetric Reaction of Life Annuity Prices to Changes in Interest Rates. *Journal of Risk and Insurance*, 83, 519–555. URL: <http://onlinelibrary.wiley.com/wam.city.ac.uk/doi/10.1111/jori.12061/abstract>. doi:10.1111/jori.12061.
- Chen, A., Haberman, S., & Thomas, S. (2023). Adaptive Retirement Planning, Sustainable Withdrawals, and Deferred Annuities. *The Journal of Retirement*, 10, 96–119. doi:10.3905/jor.2022.1.118.
- Denuit, M., Haberman, S., & Renshaw, A. (2011). Longevity-Indexed Life Annuities. *North American Actuarial Journal*, 15, 97–111. doi:10.1080/10920277.2011.10597611.
- Heimer, R. Z., Myrseth, K. O. R., & Schoenle, R. S. (2019). YOLO: Mortality Beliefs and Household Finance Puzzles. *The Journal of Finance*, 74, 2957–2996. URL: <https://onlinelibrary.wiley.com/doi/abs/10.1111/jofi.12828>. doi:10.1111/jofi.12828.
- Horneff, V., Maurer, R., & Mitchell, O. S. (2020). Putting the pension back in 401(k) retirement plans: Optimal versus default deferred longevity income annuities. *Journal of Banking & Finance*, 114, 105783. doi:10.1016/j.jbankfin.2020.105783.
- Horneff, V., Maurer, R., & Mitchell, O. S. (2023). Fixed and Variable Longevity Annuities in Defined Contribution Plans: Optimal Retirement Portfolios Taking Social Security into Account. doi:10.2139/ssrn.4322703.

References II

- Horneff, W., Maurer, R., & Rogalla, R. (2010). Dynamic portfolio choice with deferred annuities. *Journal of Banking & Finance*, *34*, 2652–2664.
- Huang, H., Milevsky, M. A., & Young, V. R. (2016). Optimal purchasing of deferred income annuities when payout yields are mean-reverting. *Review of Finance*, (p. 003).
- Jang, C., Owadally, I., Clare, A., & Kashif, M. (2022). Lifetime consumption and investment with housing, deferred annuities and home equity release. *Quantitative Finance*, *22*, 129–145.
- Jeong, S. Y., Owadally, I., Haberman, S., & Wright, D. (2023). Subjective survival beliefs and the life-cycle model. *SSRN Electronic Journal*, . doi:10.2139/ssrn.4637240.
- Koijen, R. S. J., Nijman, T. E., & Werker, B. J. M. (2011). Optimal Annuity Risk Management. *Review of Finance*, *15*, 799–833. doi:http://rof.oxfordjournals.org/content/by/year.
- Maurer, R., Mitchell, O. S., Rogalla, R., & Kartashov, V. (2013). Lifecycle Portfolio Choice With Systematic Longevity Risk and Variable Investment? Linked Deferred Annuities. *Journal of Risk and Insurance*, *80*, 649–676.
- Milevsky, M. A., & Young, V. R. (2007). Annuitization and asset allocation. *Journal of Economic Dynamics and Control*, *31*, 3138–3177. doi:10.1016/j.jedc.2006.11.003.
- Owadally, I., Jang, C., & Clare, A. (2021a). Optimal investment for a retirement plan with deferred annuities. *Insurance: Mathematics and Economics*, *98*, 51–62.
- Owadally, I., Jang, C., & Clare, A. (2021b). Optimal investment for a retirement plan with deferred annuities allowing for inflation and labour income risk. *European Journal of Operational Research*, *295*, 1132–1146.
- Scott, J. S. (2008). The longevity annuity: An annuity for everyone? *Financial Analysts Journal*, *64*, 40–48.