



# Payout-Phase of Mandatory Pension Accounts

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*(download see Rethinking Retirement Income Strategies – How Can We Secure Better Outcomes for Future Retirees? By Raimond Maurer and Barbara Somova, <http://www.efama.org/>)*

# Motivation

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With trillions invested in self-directed pension plans, “many retirees face the daunting task of determining an appropriate spending and investment strategy for their accumulated savings”. **Prof. William Sharpe** *2007 Meeting of the Wharton Pension Research Council*.

*Who stands to help retirees managing their money in retirement?*

- Insurance companies offering payout life annuities;
- Asset managers offering systematic drawdown plans;
- Both via integrated products?

*What is the role of the state?*

- Support to build up funded retirement income
- Regulate product quality and product choice
- Organize state pension programs

# Pooled versus non pooled payout solution: the key idea

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- *Simple 1-period example:*
  - *Alternative 1: direct bond investment*
  - *Alternative 2: invest in bonds through annuity*
- *Interest rate:  $r = 2\%$ , survival prob.:  $p = 80\%$*

Initial Investment	End-of-year payoff (RoI)	
	Alive	Dead
(1) 100 (in bond)	$100(1+r) = 102$ (RoI = 2%)	$100(1+r) = 102$ (RoI = 2%)
(2) 100 (in annuity)	$100(1+r)/p = 127.5$ (RoI = 27.5%)	0 (RoI = -100%)

Survival Credit = 25.5

Sufficient compensation for disadvantages ?

# Basic types of payout solutions for funded pensions

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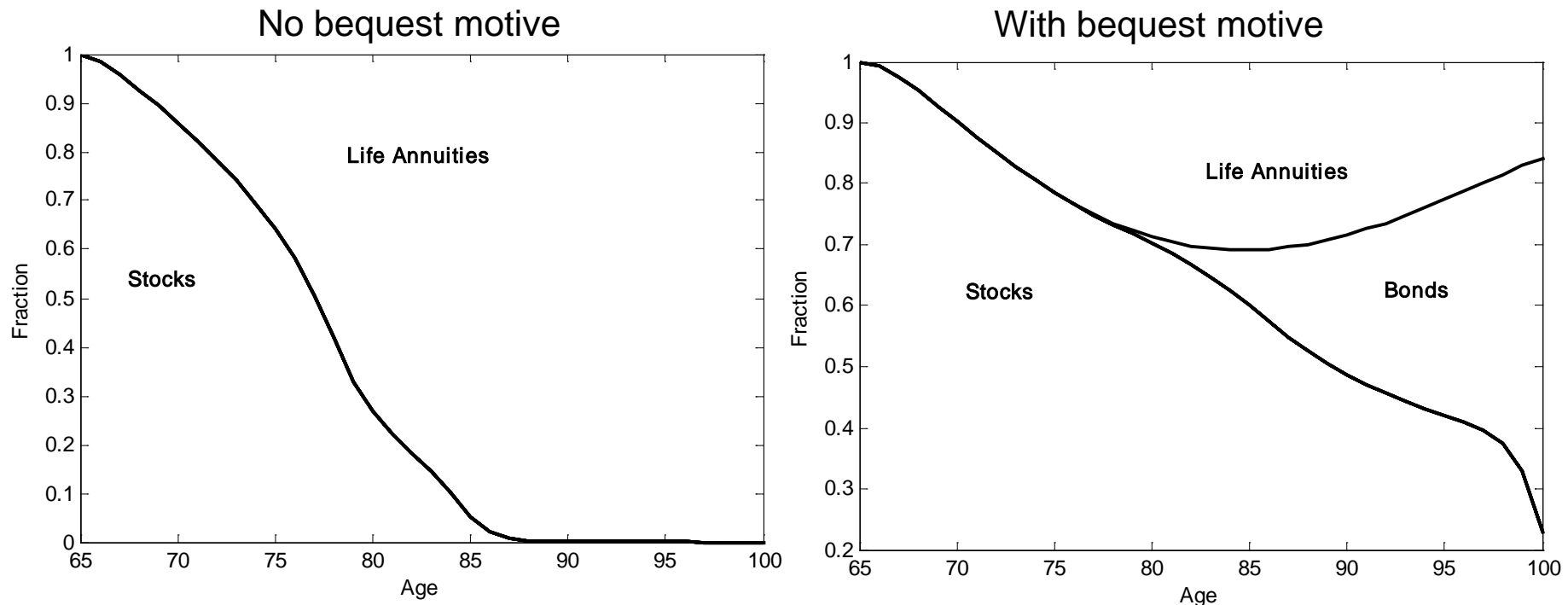
- Pooled solutions (life annuities):
  - Pro: Offer (guaranteed) life long income and “survival credit”
  - Con: Low flexibility / liquidity, no bequest, no control over retirement assets, etc.
  - Coverage: In Europe high; state pensions, DB-plans, DC-plans with mand. annuitisation
  - Coverage: Annuities with in principle fixed payouts dominant product in private market  
Markets for investment-linked annuities is increasing
  - Voluntary use of life annuities is internationally very low
  
- Non-pooled solutions (drawdown plans):
  - Pro: High liquidity / flexibility, bequest, potentially higher benefits, control over assets
  - Con: No “survival credit”. Could (but not must) be subject to longevity-/investment risk
  - Coverage: In Europe relatively new arrangement. Many programs still in saving phase (Riester, Perco, etc.). USA: most retirement funds are used by periodic withdrawals
  - Increase in the survival prob. used to price annuities (discrepancy compared to general population life expectancy) has enhanced attractiveness of drawdown plans
  
- Non-pooled solutions are not inferior to pooled solutions. No clearly dominant payout rule for everyone
  
- Integrated payout solutions combine characteristics of annuities / drawdown plans

# Economic modelling – finding the optimal investment & spending behaviour in retirement

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- Dynamic lifecycle portfolio choice model assessing optimal spending / investment behaviour of risk averse (female) retiree (aged 65) facing uncertain lifetime and uncertain capital markets returns
- Investment universe: Risky stocks, riskless bonds and illiquid life annuities
- Each period the CRRA-retiree must decide how to allocate the disposable wealth between consumption, a drawdown plan (stocks + bonds) and new purchases of annuities (with fixed benefits in real terms)
- Retiree is endowed with a certain level of savings and pre-existing annuity income (above minimum level) from state pension (2=low, 5=moderate, 10=high)
- Procedure
  - Step 1: Solve model to specify optimal consumption and investment pattern
  - Step 2: Conduct Monte Carlo simulation for 10,000 life cycles; calculate average consumption and portfolio patterns over time, accounting for retiree's optimal feedback control
  - Step 3: Evaluate various regulatory restrictions against this benchmark

# Results: optimal dynamic expected asset allocation

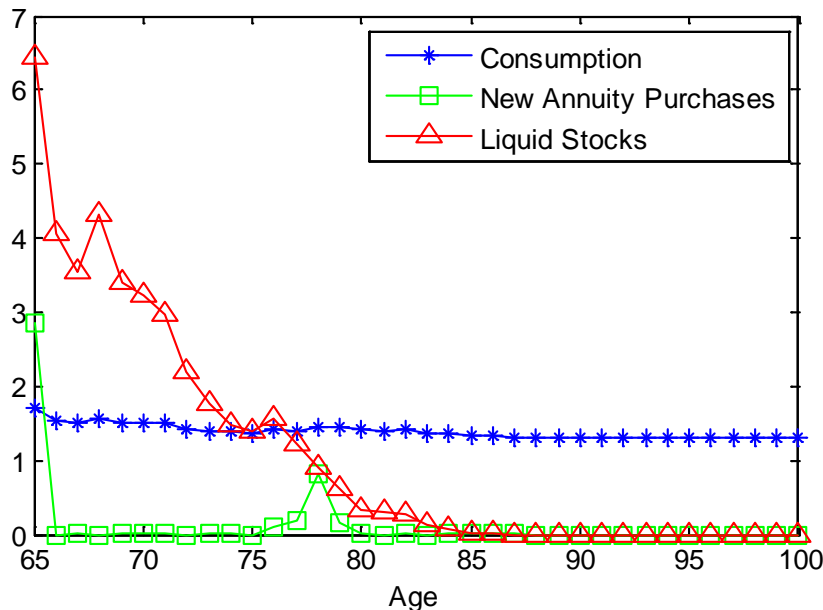


Moderate wealth/pension ratio (=5), moderate risk aversion; 10'000 life cycle, optimal feedback controls

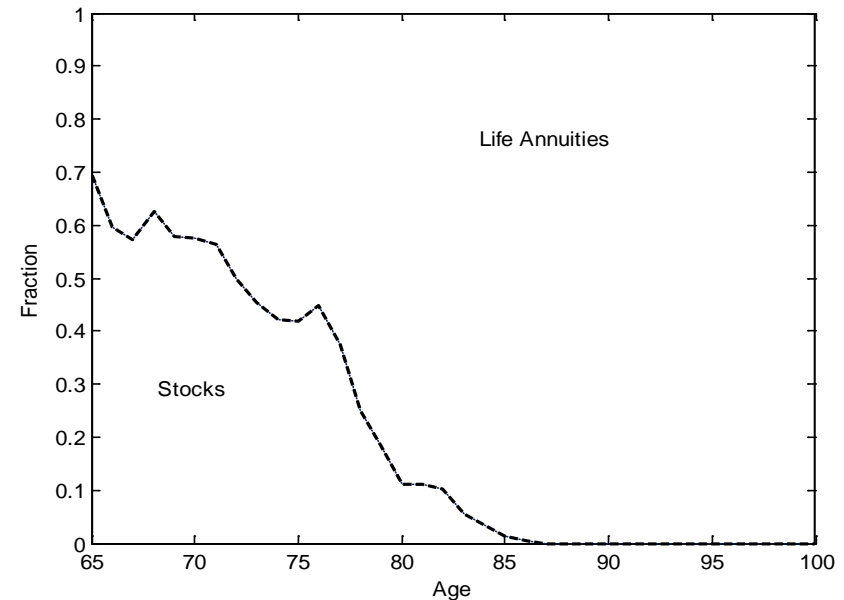
- First 10 years of retirement predominantly invested in (well diversified) stock portfolio
- Gradual shift from stocks into annuities with increasing age
- Without bequest motive, almost complete switch to annuities at the age of 87
- With bequest motive maximum investment in annuities is 30 %
- THIS IS NOT A STATIC BUT DYNAMIC STRATEGY (reaction necessary)
- How can we explain the initial high exposure to stocks?

# Results: realised life cycle profile of optimal strategy – 2002-1973 (starting with a stock market collapse)

Graph A: Realised consumption pattern



Graph B: Realised asset allocation



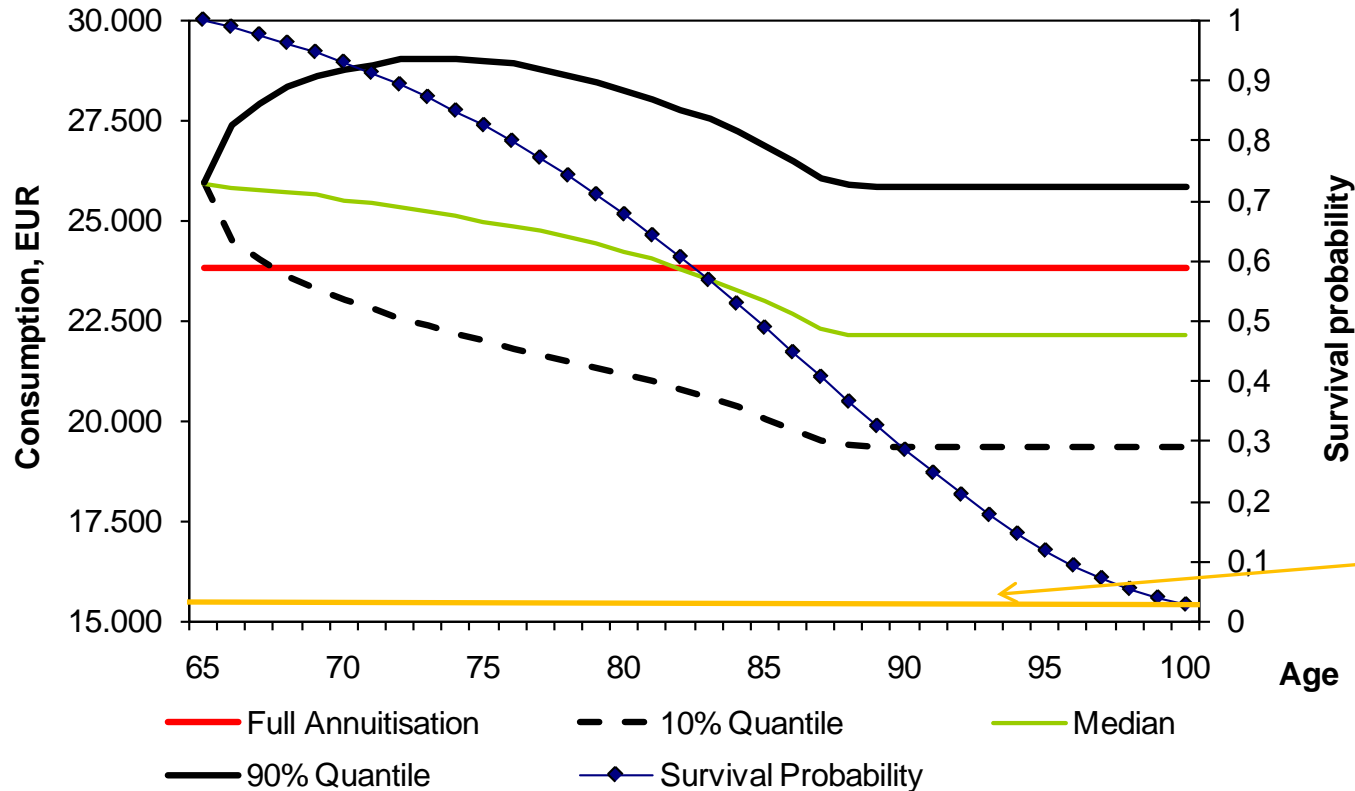
High wealth/pension ratio (=10), moderate risk aversion, no bequest



Even during unfavourable market development the retiree remains substantially invested in stocks at the beginning of retirement

Resulting consumption pattern is smooth over time

# Quantile analysis of consumption profile: optimal strategy vs. full annuitisation



High wealth/pension ratio (=10), moderate risk aversion, no bequest

➔ Following the optimal strategy retiree can expect to consume more over the complete lifecycle as compared to full immediate annuitisation, especially if survival probabilities are taken into account



# Optimal retirement strategy – integrated solutions can over higher benefits while having efficient risk controls

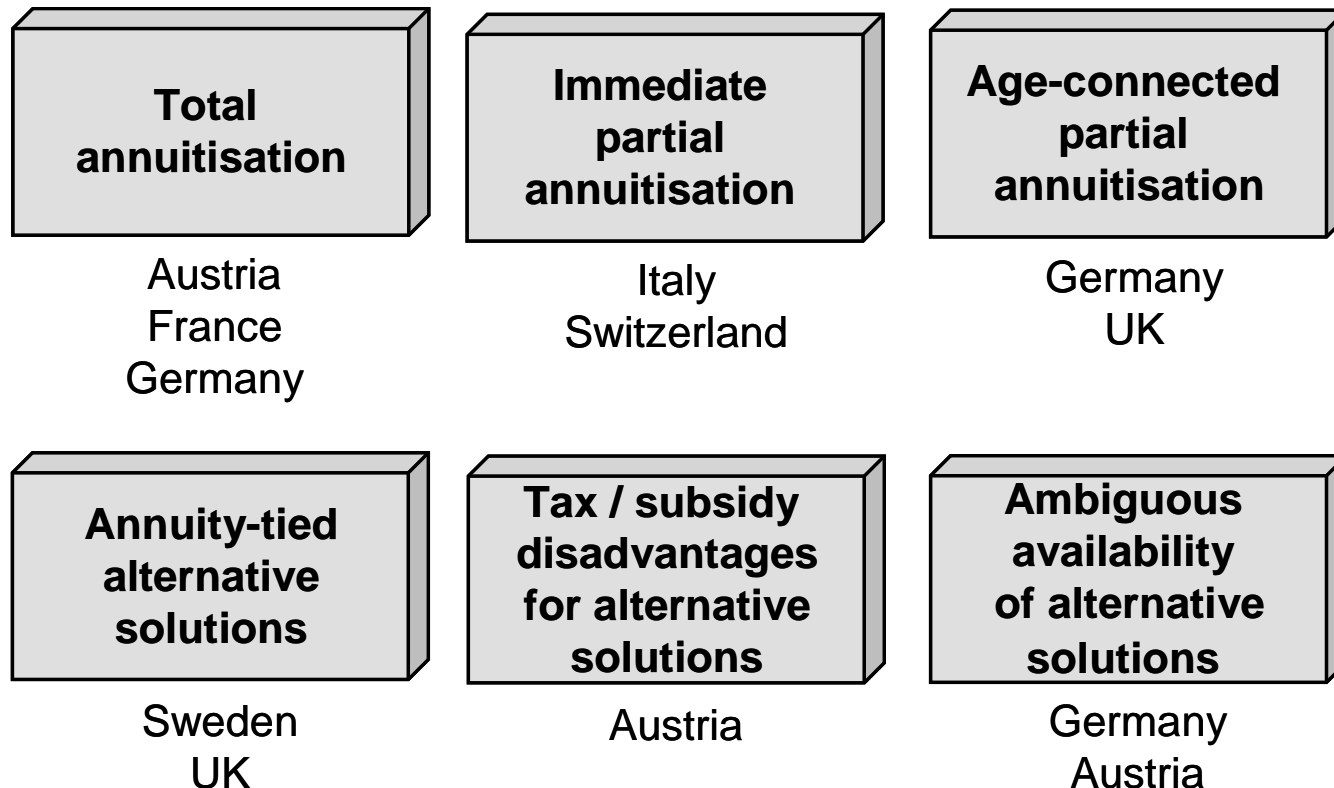
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- For successful implementation of optimal retirement strategy it is important to dynamically consider the interaction between life annuities and drawdowns during the whole retirement period
- Availability of pre-existing lifelong pension income (i.e. from state pension) and its relation to accumulated retirement funds are important determinants of the strategy
- It is difficult for the average retiree to implement such strategy without professional help
- The task of financial institutions is to create cost-efficient integrated products, based on and monitored according to dynamic lifecycle models (auto pilot)
- Products should be tailored for the needs of major characteristic retiree groups (wealth, pre-existing pension, preferences)

# Mandatory annuitisation is popular tool of policymakers for tax sponsored pension programs in Europe

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- Many different and complicated rules in Europe: Total / partial annuitisation at retirement, switching into annuities at certain ages (75 UK, 85 Germany)
- No requirements for annuitisation in the US



# Mandatory full annuitisation can result in high utility losses

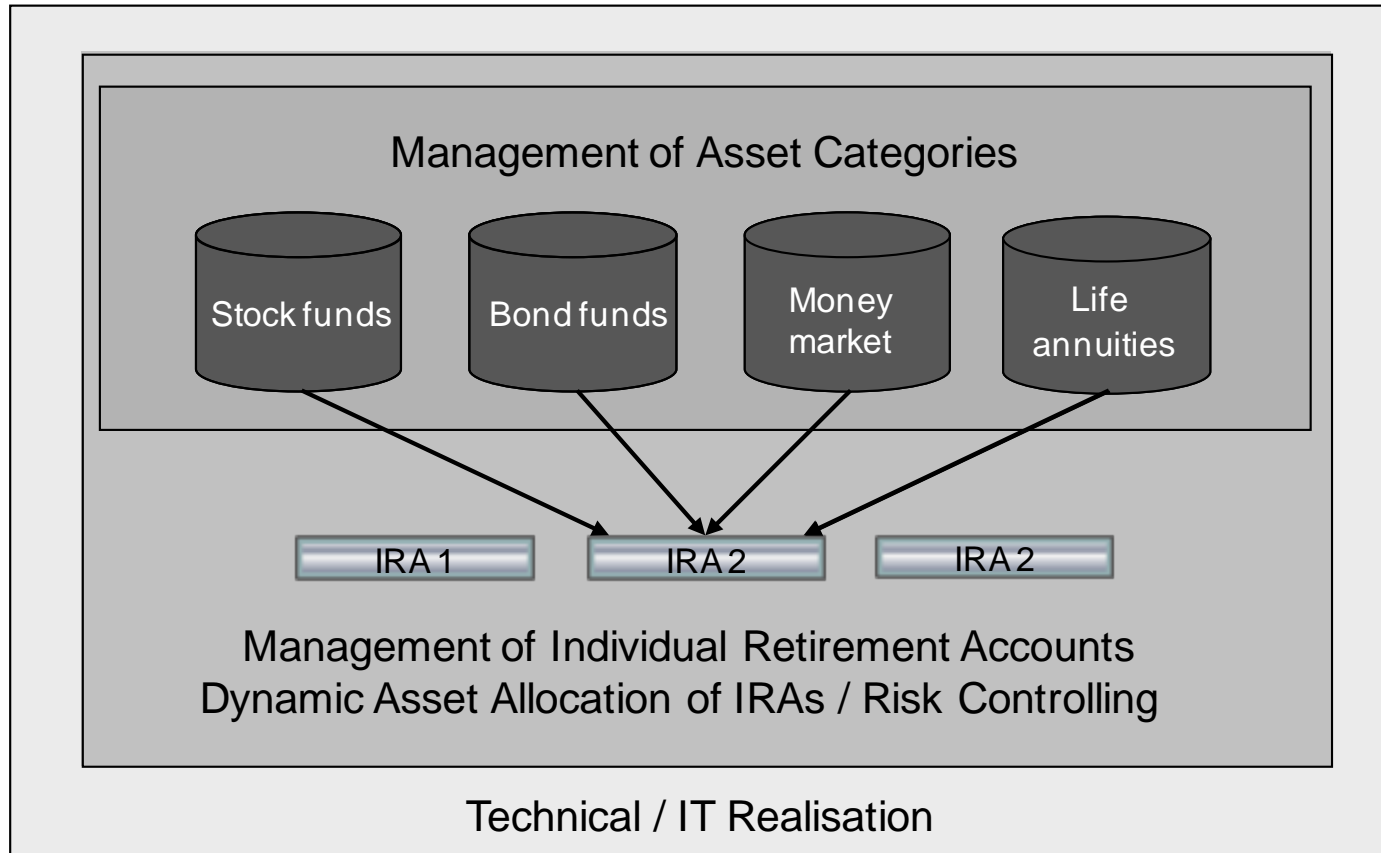
Wealth + compensation, EUR	Low risk aversion, no bequest	Moderate risk aversion, no bequest	High risk aversion, no bequest	Moderate risk aversion, bequest
Pension Level (S)	$(\rho = 2, k = 0)$	$(\rho = 5, k = 0)$	$(\rho = 10, k = 0)$	$(\rho = 5, k = 2)$
Panel 1: Retirement Wealth 30,540 / Pre-Existing Pension Income 15,270 p.a.				
Low wealth/pension ratio (S=2)	37,259 Compensation= 6,719	36,343 Compensation= 5,803	34,510 Compensation= 3,970	55,583 Compensation= 25,043
Panel 2: Retirement Wealth 76,350 / Pre-Existing Pension Income 15,270 p.a.				
Moderate wealth/pension ratio (S=5)	102,309 Compensation= 25,959	95,438 Compensation= 19,088	89,330 Compensation= 12,980	119,106 Compensation= 42,756
Panel 3: Retirement Wealth 152,700 / Pre-Existing Pension Income 15,270 p.a.				
High wealth/pension ratio (S=10)	203,091 Compensation= 50,391	183,240 Compensation= 30,540	172,551 Compensation= 19,851	213,780 Compensation= 61,080

➔ A considerable compensation is required to achieve the same utility, when there is a requirement to annuitise all retirement funds at the beginning of retirement

# How to achieve the theoretical optimum in reality?

## A suggestion of a integrated product design

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Remark 1: (Temporary) Income and/or investment guarantees provided by asset managers possible; suggestion for a new risk based solvency system for asset managers (adopted the idea for Riester pension plans)

Remark 2: DYNAMIC ALLOCATION & RISK CONTROLL NECESSARY

# Policy recommendations – regulatory reforms should balance the goals of policymakers and needs of retirees

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- The regulatory framework in Europe should be easily understandable for an average prospective retiree and find a reasonable balance between protecting the goals of policymakers while facilitating the needs of retirees by accommodating both pooled and non-pooled solutions in the set of eligible payout instruments
- Encourage and facilitate global view of retirement (including state pensions) wealth before deciding on payout restrictions to apply
- Employ selective restrictions on the use of funds: If certain threshold level of livelong income is already secured, it should be possible to invest the remaining funds at the retirees' discretion
- Should the compulsion to annuitise be used nonetheless above the minimum annuity coverage level, the annuitisation age should be set at a level where the utility losses are less profound, such as 85, alternatively, partial annuitisation of funds should be used