Consumer protection and the design of the default option of a pan-European Personal Pension Product

A study commissioned by EFAMA to SDA BOCCONI

PRESENTATION OF THE STUDY

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Structure

1

• Part 1: Introduction

Background, objective and key findings

- Part 2: Life-cycle investment strategies
 Performance under different strategies
- Part 3: Life-cycle versus guaranteed strategies
 Performance comparison

Part 1

Introduction Background, objective and key findings

Introduction Objective

- The main objective of the study is to assess whether life-cycle investment strategies which use other investment risk-mitigation techniques than a guarantee on capital, would be well suited as default strategies for the PEPP.
- Two different models have been developed:
 - One to present three life-cycle investment strategies offering different levels of exposure to equity, and to assess the risk that these strategies would not allow savers to recoup the capital invested.
 - Another one to compare the performance of life-cycle and guaranteed investment strategies in terms of wealth accumulation for retirement and capital protection.

Introduction Key policy implications

- One key implication of this study is that the regulatory design of the default option should aim at protecting less sophisticated households from holding too much of their pension savings in under-diversified, low-risk and low-return assets. Instead, regulators should give more importance to the benefits of asset diversification, which constitutes an effective tool to mitigate credit and inflation risks.
- The solid results achieved by life-cycle strategies demonstrate the effectiveness of **asset diversification and de-risking** as risk-mitigation tools. Life-cycle strategies are capable of delivering a return significantly greater than life-insurance products with a guarantee and a participation in the upside.
- The low return offered by guaranteed strategies is largely due to the current low interest rate environment and to the rigid capital requirements induced by the liability structure of a guaranteed product, which impose a very conservative asset allocation.

Part 2

Life-cycle investment strategies Performance under different strategies

Life-cycle investment strategies Key predictions of household finance models

- Because human capital can be compared to a bond-like asset, young households should invest in equities because their accumulated financial wealth tend to be low and their human capital high.
- The risk exposure and the share of equity investment should decrease along a "glide path" as households become older because their human capital becomes a smaller component of their total wealth.
- Households should be allowed to maintain a certain level of exposure to growth assets during their **post-retirement** period. This would give them the opportunity to recover from any losses suffered under adverse market conditions. It there is an obligation of converting the accumulated wealth into an annuity, there is a risk that such losses are "locked in".
- More sophisticated (especially more educated and richer) households tend to behave closer to the prescriptions of theoretical models, i.e. they hold a much larger share of their financial wealth in stocks than less advantaged households. The regulatory design of the default option should avoid encouraging less sophisticated households to hold too much of their pension savings in under-diversified, low-risk and low return asset portfolios.

Life-cycle investment strategies Key assumptions

• Contributions to pension plan

- Accumulation phase of 40 years, i.e., consumer joins pension plan at age 25 and retires at age 65.
- Annual initial wage of €18,000 (current euro area average net income), growing at a constant 2% per annum to reach about €40,000 at retirement age.
- Annual contribution to pension plan equal to 10% of wage, so the total contributions reach about €110,000 at retirement age.

• Simulation approach

- ➤ A "Monte Carlo Bootstrap" simulation approach is followed to generate 5,000 simulated pension wealth accumulation levels at the retirement date (year 40).
- ➤ The 5,000 pension wealth accumulation levels are obtained by randomly drawing assets returns covering the period starting in January 1988 to November 2017.
- Four asset returns are used: the total return on German T-bills, the total return index on German 10-year government bonds, the total return index on Italian 10-year government bonds, and the total return of the MSCI Europe equity index.

Life-cycle investment strategies Three different strategies







An annual management fee of 1% is charged the accumulated assets.

Strategy 1

- Initial allocation remaining constant for 30 years: 50% equity, 25% defaultable bonds, 25% risk-free bonds
- Allocation at year 40 following 10 years of de-risking: 25% equity, 25% risk-free bonds and 50% cash

Strategy 2 (Poterba-style)

- Initial allocation: 75% equity, 12.5% defaultable bonds, risk-free bonds
- Equity share falls according to formula "100% saver's age"
- Allocation at year 40: 35% equity, 25% risk-free bonds and 40% cash

Strategy 3

- Initial allocation: 100% equity fixed for 30 years
- De-risking starts at year 30, with switching from equity towards cash and risk-free bonds
- Allocation at year 40: 50% equity, 25% risk-free bonds and 25% cash

Life-cycle investment strategies Performance under Poterba Strategy



The chart illustrates the performance of the life-cycle strategy by showing the distribution of the ratio of the total pension wealth accumulated at retirement age and the total contributions made by the saver. The performance can be summarized in the following way:

- > 95% of the savers can expect to accumulate pension assets greater than 2.42 times the capital invested.
- ▶ 50% of the savers can expect to accumulate pension assets greater than 4.61 times the capital invested.
- ➤ The probability that the pension wealth accumulated is lower than the total contributions is not significantly different from zero in statistical terms.

Life-cycle investment strategies Shortening the accumulation phase to 20 years



- It is assumed that consumers start to save at age 45 in a pension plan following a Poterba-style life-cycle strategy, starting with an equity exposure of 55%
- 95% of the savers can expect to accumulate pension assets greater than 1.40.
- 50% of the savers can expect to accumulate pension assets greater than 1.96 times the capital invested, compared to 4.61 under a 40-year accumulation period.
- The reduction in this ratio can be explained by the fact that a shorter saving period reduces the period during which the returns on the contributions can generate additional returns and asset growth, i.e. the law of compound interest is much less powerful under a short investment period.
- There is a 0.14% probability that the pension wealth accumulated is lower than the total contributions.

Part 3

Life-cycle versus guaranteed strategies *Performance comparison*

Life-cycle versus guaranteed strategies Key assumptions

• Asset return dynamics

- A Vector AutoRegression model is used to generate 5,000 possible scenarios of the random evolution of market returns and the term structure of risk and correlations
- ➤ An fee of 0.5% is charged up-front on every policy contribution and an annual management fee of 0.5% is charged the accumulated assets
- MAIN ADVANTAGE: in this way the simulation can take into account the performance in real terms of different strategies conditional on different economic conditions.

• Two scenarios are considered for robustness w.r.t the secular decline in interest rates

- > The "old normal" economic environment, reflecting the economic and financial conditions experienced over the 1969-2012 period, characterized by the two oil shocks and a sharp hike in interest rates
- > The "new normal" economic environment, reflecting the economic and financial conditions experienced over the 1992-2012 period, characterized by falling interest rates and inflation rates

Life-cycle versus guaranteed strategies A stylized model of a participating life-insurance policy management

- To quantify the performance of guaranteed strategies, it is assumed that the insurer follows an asset-liability management procedure to dynamically adjust its balance sheet in order to (i) service the policyholders, (ii) compensate its shareholders for providing funding, and (iii) fulfill regulatory requirements.
- In exchange for the policyholders' annual contribution, the insurer commits to credit their account with a minimum guarantee nominal interest rate each year, and participation in the asset performance under favorable market conditions.
- A dividend is distributed to shareholders to remunerate them for the capital provisions needed to ensure that the accumulated assets net of dividends do not fall short of liabilities.
- To fulfill regulatory requirements, it is assumed that the insurer
 - Keeps a static asset allocation, investing 95% of its balance sheet in long-term bonds in the old normal and 90% in the new normal. The high bond exposure can be explained by the current Solvency II capital charges on equities and the liabilities created by the guarantee, which force insurers to hold long duration securities on the asset side.
 - > Sets the level of the minimum guarantee to ensure that the ratio between the expected shortfall and the present value of future contributions is smaller than 0.5%.

Life-cycle versus guaranteed strategies Three different life-cycle strategies







Strategy 1 (low equity)

- Initial allocation: 60% equity, 40% risk-free bonds.
- Equity share falls according to formula "85% saver's age"
- Allocation at year 40: 20% equity, 80% risk-free bonds

Strategy 2 (medium equity)

- Initial allocation: 75% equity, 25% risk-free bonds.
- Equity share falls according to formula "100% saver's age"
- Allocation at year 40: 35% equity, 65% risk-free bonds

Strategy 3 (high equity)

- Initial allocation: 90% equity, 10% risk-free bonds.
- Equity share falls according to formula "110% saver's age"
- Allocation at year 40: 50% equity, 50% risk-free bonds

Life-cycle versus guaranteed strategies Comparison of pension wealth distribution

"Old normal" "New normal" Poterba Rule Life-Cyole vs With-Profit Minimum Guarantee Poterba Rule Life-Cyole vs With-Profit Minimum Guarantee 0.3 0.7 0.25 0.6 • High equity LCS • Low equity LCS 0.5 0.2 in blue in blue Auppapara 0.15 Probability 0.4 Guaranteed Guaranteed strategy in orange strategy in orange 0.3 0.1 0.2 0.05 0.1 0 10 0 1 2 5 0 0 0 CumulatedWealth/MoneyBaok CumulatedWealth/MoneyBaok

The charts show the distribution of the ratio of the pension wealth accumulated at retirement age in real terms and the total contributions. A ratio of 2 means that the pension wealth has a purchasing power twice as big as that of the total contributions. Each bar shows the percentage of savers who can expect to benefit from a specific ratio.

Under the old normal, the guaranteed strategy generates for the majority of savers a pension wealth at least two times greater than the total contributions. This good result can explained by the fact that insurers can offer a4.25% nominal minimum guaranteed rate of return consistent with market conditions and solvency constraint.

The situation is very different under the new normal in which the pension wealth generated by the life-cycle strategy is significantly higher than that generated by the guaranteed strategy. This is because the minimum nominal guaranteed rate is only 1.5%.

Life-cycle versus guaranteed strategies Comparison of real rates of return

"Old normal"





"New normal"

Under the old normal, the guaranteed strategy generates a median real return of at least 3.3% for the majority of individuals compared to a minimum median of 5.9% rate for the life-cycle strategies.

Under the new normal, life-cycle strategies generate for the majority of individuals a real rate of return of at least 5.1%, compared to 1.2% for the guaranteed strategy. For 95% of individuals, the real return is at least equal to 2.8%, compared to 0.8% for the guaranteed strategy.

The comparison of the two charts confirms that the emergence of a new normal economic and financial environment, coupled with the Solvency II constraints, has had a significant adverse impact on the return offered by the guaranteed pension product.

Life-cycle versus guaranteed strategies Shortening the accumulation period to 20 years

"Old normal"



"New normal"



Under the old normal, the guaranteed strategy generates a real return of at least 3.1% for the majority of individuals compared to 6.2% on average for the life-cycle strategies.

Under the new normal, life-cycle strategies generate for the majority of individuals a median real rate of return of at least 5.8% on average, compared to 1.4% for the guaranteed strategy. For 95% of individuals, the equivalent rates of return are 1.7% and 0.8%, respectively.

Life-cycle versus guaranteed strategies Capital protection

"Old normal"



Minimum probability of recouping the inflation-adjusted capital invested after 20 years 99.9%</

Under the life-cycle strategies, the savers will end up with a pension wealth higher than the inflation-adjusted capital invested, with a probability greater than 99.2% under the old normal and greater than 99.9% under the new normal.

In the new normal, if insurers only invest 5% of their portfolio in equities, the guaranteed strategy allows savers to recoup the inflation-adjusted capital with a minimum probability of 99.7%, compared to 99.9% when the portfolio has a 10% equity exposure.

"New normal"

Life-cycle versus guaranteed strategies Key takeways

- Life-cycle strategies offer a level of capital protection as high as a financial guarantee.
- At the same time, life-cycle strategies tend to offer much higher returns thanks to their ability to generate return during most of the accumulation period and to reduce investment risk as the planned retirement approaches.
- By generating superior returns and comparatively low risk compared with a formal minimum return guarantee, life-cycle strategies offer savers a very good compromise between a financial guarantee, which comes at the price of foregoing significant returns, and an equity-only strategy, which can lead to heavy losses if there is a stock market decline right before the end of the accumulation period.
- A minimum guarantee contract caters investors' perception that over-weights market risk with respect to other long term sources like e.g. inflation, credit or actuarial risks.

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