MASTER

ACTUARIAL SCIENCE

MASTER´S FINAL WORK

INTERNSHIP REPORT

THE PEPP: HOW TO BRIDGE THE CURRENT GAP IN EUROPEAN PENSION SCHEMES

FRANCISCA MOREIRA RODRIGUES

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ABSTRACT

The European Union is facing an ageing society. The sustainability of the social security systems is at risk in a number of countries, the pension coverage is frequently low and there is a high percentage of poverty amongst older people. These reasons, associated to the recent creation of a new personal pension product, the Pan-European Personal Pension Product (PEPP), motivated this research. In fact, the main objective of our study is to «dissect» this (still unknown) product, that can make a difference for people to enjoy their retirement years more securely.

PEPP is an innovative product that aims to challenge the *status quo* of supplementary pension vehicles in the EU, which experts have described as complex, fragmented and often very costly. Differing from the current Portuguese retirement saving plan (PPR) in some important aspects, such as portability, PEPP allows its customers to keep saving towards their pensions, even in the event of moving to another Member State of the European Union.

In addition, the study aims to perceive whether the Portuguese company where the internship took place, CA *Vida – Companhia de Seguros*, would profit from marketing this new product, considering its typical customer and a profit testing carried out on the PPR product it currently offers. It would have been interesting to perform the same test for the PEPP and compare results, however there is still no statistical data on the latter, as it is not yet on the market. Nevertheless, a few conclusions resulted from the work and the internship, as a whole.

KEYWORDS: Life Insurance; Pension Plans and Funds; PEPP; PPR; Profit Testing.

Resumo

A população da União Europeia está a envelhecer. A sustentabilidade dos sistemas de segurança social está em risco em vários países, a cobertura das pensões é frequentemente baixa e existe uma elevada percentagem de pobreza entre os idosos. Tais razões, associadas à recente criação de um novo produto de pensões pessoais, o Produto Individual de Reforma Pan-Europeu (PEPP), motivaram esta investigação. De facto, o principal objetivo do nosso estudo é «dissecar» este produto (ainda desconhecido), que pode fazer a diferença para que as pessoas possam usufruir dos anos de reforma com mais segurança.

O PEPP é um produto inovador que visa combater o panorama atual dos veículos de previdência complementar na UE, que os especialistas descreveram como sendo complexo, fragmentado e frequentemente muito caro. Diferencia-se do atual plano de poupança reforma (PPR) português em alguns aspetos importantes, nomeadamente a portabilidade, pois o PEPP permite aos aderentes continuarem a poupar, mesmo mudando de residência para outro Estado-Membro da União Europeia.

Adicionalmente, o presente estudo visa analisar se a empresa portuguesa CA Vida - Companhia de Seguros, onde o estágio se realizou, lucraria com a comercialização deste novo produto. Para isso, considerou-se o seu cliente típico e realizou-se um exercício de *profit testing* aplicado ao PPR que comercializa, com hipóteses que o aproximariam de um possível PEPP. Teria sido interessante comparar os resultados com os de um mesmo teste realizado para o PEPP propriamente dito, porém ainda não há dados estatísticos para isso. Ainda assim, algumas conclusões resultaram do trabalho e do estágio, no seu conjunto.

PALAVRAS-CHAVE: Seguros de Vida; Planos e Fundos de Pensões; PEPP; PPR; *Profit Testing*.

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ACRONYMS AND ABBREVIATIONS

APFIPP	*Associação Portuguesa de Fundos de Investimento, Pensões e Patrimónios*
ASF	*Autoridade de Supervisão de Seguros e Fundos de Pensões*
CA	*Crédito Agrícola*
DB	Defined Benefit Pension Plan
DC	Defined Contribution Pension Plan
EIOPA	European Insurance and Occupational Pensions Authority
EPC	Economic Policy Committee
ESG	Environmental, Social, and Governance
EU	European Union
GDP	Gross Domestic Product
INE	*Instituto Nacional de Estatística*
IORPs	Institutions for Occupational Retirement Provision
OECD	Organisation for Economic Co-operation and Development
PEPP	Pan-European personal Pension Product
PPR	*Plano de Poupança-Reforma*

Chapter I
Introduction

1.1 Context and Motivation

This report results from a 6-month internship at the Actuarial Management department from the Portuguese life insurance company *Crédito Agrícola Vida – Companhia de Seguros*. Its main objective is to prepare a study on long-term savings, namely on the European Union project, currently underway, on the Pan-European personal Pension Product (PEPP).

In the first weeks of the internship, I was introduced to the other departments of the company, to get to know all my colleagues and to have a real perception of what is done in the different departments and how they interact with each other in the workday routine. Later, I had the opportunity to develop operational activities in the area of actuarial life, such as policy validations, calculations of premiums and mathematical provisions. I get to understood the internal processes and programs used by the company to fulfill its daily activities. The internship allowed me to complement my academic background, becoming more familiar with the technical terms of insurance and better understand the life insurance business.

As a young woman highly concerned about the future and having the perception that the current pension systems in Portugal and other countries in Europe are not efficient enough to provide monetary security to people in their retirement (Chapter II), I prepared this report in a manner to present an innovative new product and an alternative to the EU citizens that wish to save for a time.

1.2 Definitions

For the text to be as self-contained as possible, in this section we give a few concepts that will be referenced during the report, even though some of them are already known.

(1) **'Pay-as-you-go basis'** is a system in which currently paid benefits are funded by currently collected contributions;

(2) **'Occupational pensions'** are pension schemes organised at the level of company or sector and accessed through an employment relationship;

(3) **'Personal pensions'** are individual contracts with a pension insurance provider;

(4) ‘PEPP provider’ is a financial undertaking, referenced in Section 3.2.1, authorised to design and distribute PEPPs;

(5) ‘PEPP distributor’ means a financial undertaking (authorised to distribute PEPPs that it did not create), or an investment firm providing investment advice, or an insurance intermediary as defined in point (3) of Article 2(1) of Directive (EU) 2016/97 of the European Parliament and of the Council;

(6) ‘Competent authorities’ means the national authorities designated by a Member State to supervise PEPP providers and distributors;

(7) ‘Defined Contribution (DC) plan’ is a retirement plan where the employer and the employee make predetermined contributions into a fund, so that when the employee retires the proceeds are available to provide income throughout retirement;

(8) ‘Defined Benefit (DB) plan’ is a retirement plan which offers retirement income based on service and salary, the pension amount being calculated with a defined formula. The DB scheme is funded by contributions paid by the employer and the employee over the working lifetime of the latter.

1.3 Structure of the text

Chapter II focuses on providing a theoretical explanation of the Social Security Pillar System and gives context and reasons for having a new personal pension product in the EU countries. Context on the evolution of longevity, pension coverage and poverty in older ages is provided. Also, in the same chapter, the context in Portugal is specified. Chapter III highlights the history of the creation of PEPP and its regulation. In Chapter IV, an explanation of the retirement savings plan in Portugal and, in particular, the one marketed by the company CA *Vida* - CA PPR [Capital] - are presented, as well as the differences between the latter and PEPP. Besides, a profit testing was made and is explored in this chapter. Chapter V presents the main conclusions resulting from the work.

Chapter II
The Need for a New Personal Pension Product

Due to an aging global population, the erosion of traditional and informal systems of family support, and deficiencies in governance and administration of existing pension systems, the World Bank has been responding to the need to provide old age income assistance through the expansion of social insurance and contractual savings systems since the mid-1980's.

According to the Bank's experience, there are neither universal solutions nor a simple reform model that can be applied in all environments. However, the Bank has developed principles of analysis and a conceptual framework to guide its work. It includes an assessment of initial conditions and capacities and the establishment of core objectives, followed by an evaluation of potential modalities for pension systems, applying a multiple-pillar model of potential reform projects.

This entire section (2.1; 2.1.1) can be referenced by (World Bank, 2008).

2.1 Social Security Pillar System

The World Bank has set a five-pillar model consisting of:

- A non-contributory "zero pillar" typically financed by the local, regional or national government, if fiscal conditions allow. It aims to explicitly address the goal of poverty reduction, in order to provide all older people with a minimum level of protection, ensuring that lifelong low-income people receive basic protection at old age.
- A mandatory "first pillar", where people make contributions depending on their earnings, in order to replace some percentage of lifetime pre-retirement income. The first pillar deals, among others, with the risks of individual myopia, low returns and inadequate planning horizons, due to the uncertainty of life expectancies and the risks of the financial markets. These contributions are, in particular, subject to demographic and political risks, since "first pillars" operate on a pay-as-you-go basis.
- A mandatory "second pillar", typically a defined contribution plan with a wide range of design options. Defined contribution plans establish a clear relationship

between contributions, investment performance and benefits. They support enforceable property rights and can also support financial market development. Participants may be subject to financial risks, when compared with defined benefit plans, resulting from the private asset management, the risk of high transaction and administrative costs, and the longevity risk.

- A “third pillar”, which is a voluntary private pension provision and an addition to the benefits from Pillar 1 and Pillar 2. It aims to fulfill retirees’ individual wishes and to maintain their accustomed lifestyle. In current times, according to (AXA, 2021), benefits from Pillars 1 and 2 will often not suffice to maintain people’s accustomed lifestyle throughout old age. Although the third pillar includes risks similar to those in the second pillar, they compensate for inflexibilities in the design of other systems.
- A non-financial “fourth pillar”. It includes access to informal support, such as family support and formal social programs, regarding health, housing. or individual financial and non-financial assets, such as home ownership and reverse mortgages, when presented.

Given the aims and scope of this report, we will focus on the following three: the first and second mandatory pillars, together with the voluntary third pillar.

2.2 Situation in the European Union

According to (European Commission, 2021), by 2070, due to an increasing life expectancy, 30.3% of the population in the European Union is projected to be aged 65 years or older (in 2019 the percentage was 20.3%) and 13.2% is projected to be aged 80 years or older (compared to 5.8% in 2019). The Union is facing an ageing society. This can also be referenced and graphically represented in (European Commission, 2020b), pages 9-10.

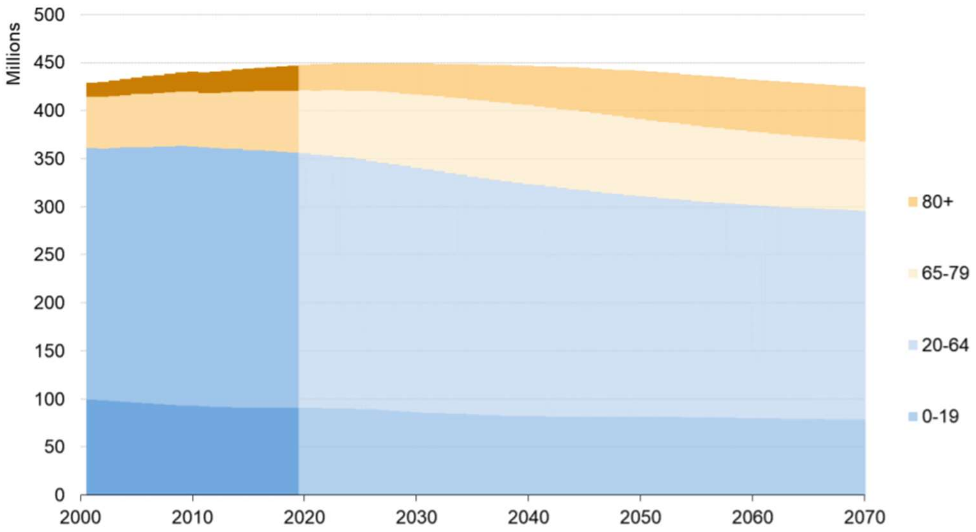


Figure 1. Population by age groups, EU-27 (2001 – 2070)
Source: Eurostat

The graphic not only shows an increase in the number of people in the older age groups, but also a decrease in working-age population (20-64 years). It also shows that the number of children and young people (aged 0-19) is projected to also decrease, by 12.6 million, in 2070.

One of the main incentives behind changes in pension policies and reforms is exactly the population ageing. According to (OECD, 2019), facing an ageing society may involve an increase in contributions, which can lead to lower net wages and higher unemployment, and/or a reduction in pension promises. In this context, if the goal is to maintain pension adequacy and financial sustainability, working for a longer period of time is crucial.

Since 2019, most pension reforms focused on loosening age requirements to receive a pension (case in Italy, the Netherlands and the Slovak Republic), increasing pension benefits including first-tier pensions (case in Austria, France, Italy, among others), expanding pension coverage or encouraging private savings. For instance, Norway, which according to a study made by *Mercer and Monash Business School,* presented in (Consultancy.eu, 2019), has one of the top pension systems in the world in adequacy, sustainability and integrity, is adopting the measure of bringing public sector pension benefits more in line with private sector benefits. Cf. (OECD, 2019).

Besides the ageing situation, low pension coverage and adequacy are a reality in many EU countries. According to (European Comission, 2017), p. 9, complementary retirement savings are necessary to guarantee suitable replacement rates in the future, either taking the form of occupational or personal pensions. Only Denmark, Finland, the Netherlands and Sweden have an occupational pension coverage above 80%, while Belgium and Germany have over 50% coverage. In the majority, though, the coverage is low to non-existent. Personal pensions are relatively well accepted in only a few countries, like Czech Republic, Germany and Sweden. In most countries it is moderate and fragmented, or even so low that it matters little to nothing for the average income replacement.

Another concern point is the poverty in older ages. Numbers show that over 20% of EU citizens are at risk of poverty or social exclusion, see (Eurostat, 2020).

The at-risk-of-poverty rate is the proportion of people with an equivalent disposable income below the at-risk-of-poverty threshold (60% of the national median equivalent disposable income, after social transfers). Instead of analyzing wealth or poverty, this indicator measures low income compared to other residents in that country.

The at-risk-of-poverty rate among elderly people (over 65 years old) in the EU was around 16% in 2020, as showed in Figure 2. There has been a noticeable increase since 2013 for the elderly, as observed in Figure 2. (Eurostat, 2021)

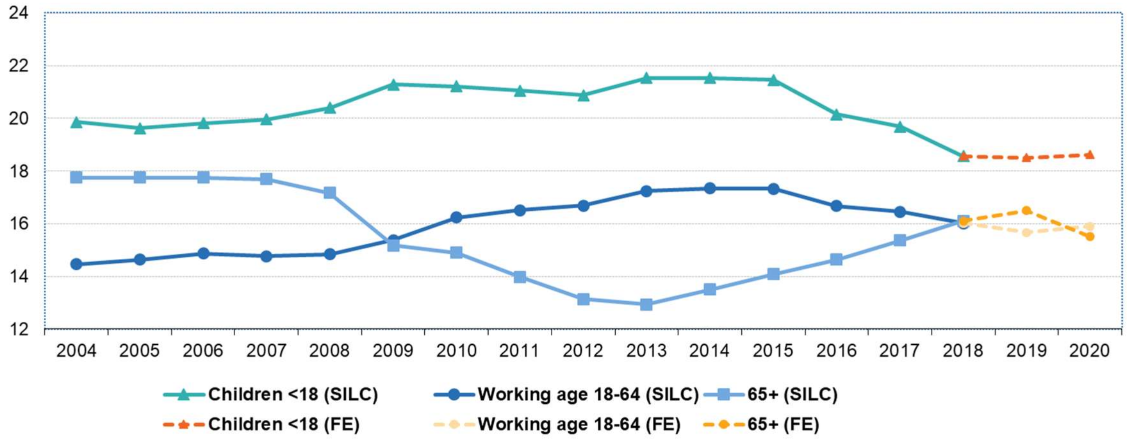


Figure 2. At-risk-of-poverty rate in the EU by age group, (2004-2020) (%)
Source: (Eurostat, 2021)

2.3 Situation in Portugal

Portugal, like the rest of Europe, is ageing. According to (INE, 2020), the number of elderly people is expected to rise from 2.2 to 3.0 million, in what they call “the central scenario”, and the aging rate (defined as the quotient between the number of people aged

65 and over and the number of people between 0 and 14 years) will almost double, as a result of the decrease in young population and the increase in the elderly population.

In addition, there will be a decrease in the working age population. The working age population (from 15 to 64 years old) residing in Portugal will decrease from 6.6 million in 2018 to 4.2 million in 2080, in the central scenario. As such, the dependency ratio (quotient between the number of people aged 65 and over and the number of people aged between 15 to 64) will also increase sharply.

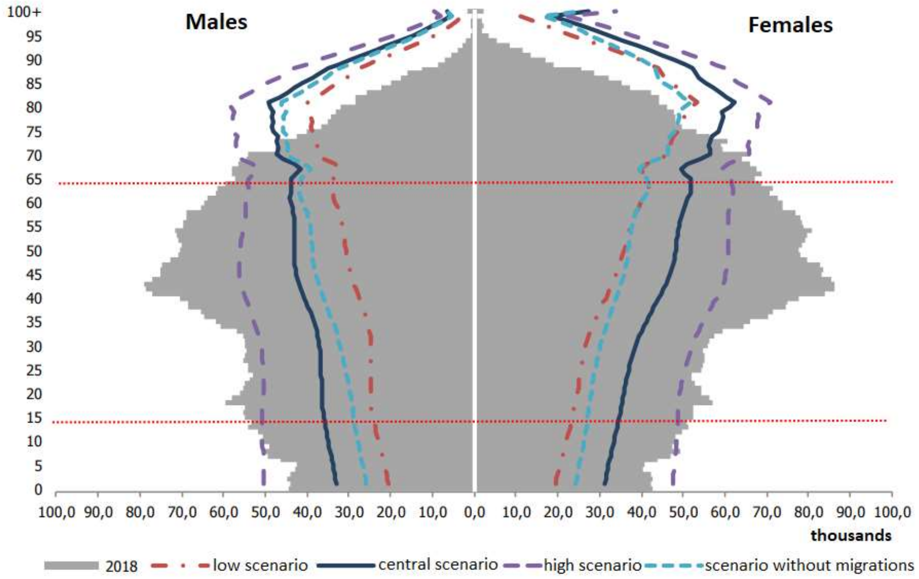


Figure 3. Age pyramid, Portugal, 2018 (estimates) and 2080 (projections)
Source: (INE, 2020)

The subsequent part of this section follows the document (GPEARI, 2018), which contains the “Pension Projection Results” obtained by the Ageing Working Group.

The EPC’s **Working Group on Ageing Populations and Sustainability (AWG)** [1] aims to assist policy formation, by enhancing the quantitative assessment of public finances and their long-term sustainability, together with the economic consequences of EU member states’ ageing population.

The main Portuguese pension systems are: (i) the public system, which consists of two schemes: the Social Security (SS) system, and a subsystem that only covers civil servants who have joined the public sector until 2005, named *Caixa Geral de Aposentações*

[1] See https://europa.eu/epc/working-groups-epc/working-group-ageing-populations-and-sustainability_en

(CGA)[2]; (ii) the private occupational pension system financed by pension funds, which comprises the occupational schemes (banking sector DB, other DB and DC schemes) and personal schemes (individual adhesions to open pension funds and/or retirement saving schemes (PPR - *Planos de Poupança Reforma*, in Portuguese)). Additionally, there are some private pension schemes, which comprise occupational schemes, funded by group insurance policies. Personal schemes were not included in the study due to the lack of data necessary to make assumptions and model cash flows for the future. Pensions related to the banking sector that were transferred to the Social Security system were also not included. The main results of the projections are (values in % of GDP):

- Total pension (public and private occupational pensions) is expected to decrease by 2.2p.p. of GDP (from 13.8% in 2016 to 11.7% in 2070), after reaching a peak in 2038 (15%). Note that the occupational pension expenditure has a minor impact than the public pension in this result;
- Occupational pensions expenditure is expected to slightly decrease over the first decades of the projection horizon (from 0.3% in 2016 to 0.2% in 2050) and then increase again to 0.3% in 2070, due to a gradual reduction of the number of beneficiaries relative to DB schemes;
- Pension expenditure with regard to DC schemes is expected to significantly increase over the years;
- Public pension system expenditure as a whole is expected to decrease by 2.2p.p. of GDP (from 13.5% in 2016 to 11.4% in 2070), after reaching a peak in 2038 (14.8%). The part of the Social Security is foreseen to raise and the part of CGA is expected to decrease, since it is a closed system;
- Old-age pension expenditure (the main responsible for total public pension expenditure) is planned to start at 11.2%, increasing up to 12.5% in 2039 and then starts to decrease until 9.7% by the end of the projection period;
- Survivors and disability pension expenditures decrease by 0.5p.p. and 0.2p.p. of GDP, respectively, as population's growth seems to be shifting downward.

[2] CGA subscribers enrolled since September 1993 are subject to the same rules defined for the general regime of Social Security. The new public employees are enrolled in the Social Security system since January 2006, and therefore the number of CGA active members will monotonically converge to zero in the 2050s.

Besides the evolution of the dependency ratio, predicting almost 73 elderlies for each 100 persons in the working age group by 2070 (the "baseline scenario"), several predictions analyzing other ratios have been done. In particular, the coverage ratio (number of pensioners over people with 65 years or more) and the public replacement ratio (percentage of a person's pre-retirement income needed to maintain the lifestyle at retirement The coverage ratio effect can be divided into three components: (1) the old-age coverage ratio (-3.1p.p.), which reflects the rise on the normal retirement age; (2) the early-age coverage ratio (-6.4p.p.), explained by the decrease of the number of orphans that have survivor pension; (3) the cohort effect, which shows the most negative contribution (-8.6p.p.) as population older than 65 increases more than the population in cohort 50-64. The public replacement ratio is expected to increase in the first decade of the projection period (from 49% in 2016 to 59% in 2026) and then decrease until 2070, reaching 44%, less 5p.p. than in the beginning.

These elements are relevant to be analyzed, since, in fact, it is clear that pensions resulting from Pillars 1 and 2 will not be suffice to fulfill the needs of the retirees and people in the working-age will be forced to pay pensions for older people.

Further details are in (GPEARI, 2018), pages 22-32.

To get an overview of the sensitive analysis of pension expenditure projections under different scenarios, cf. Appendix B – Table 1B and Figure 4.

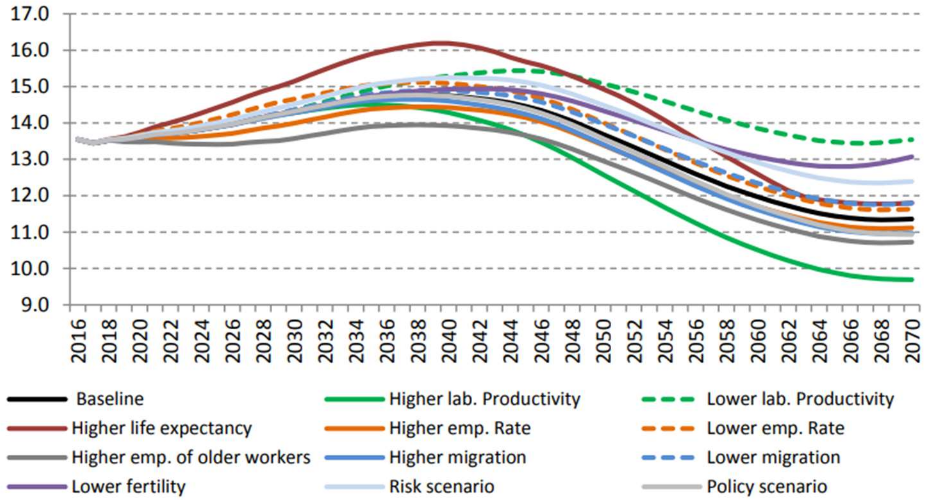


Figure 4. Public expenditure (% of GDP) (2016-2070) (projections)
Source: GPEARI and GEP

It is clear that the results are coherent with the different scenarios and, observing all lines along the whole period, one can see that expenditure is more affected by labour productivity, life expectancy, fertility and older workers employment changes.

Some relevant conclusions, taken from Figure 4 and Table 1B, are:

- higher labour productivity reduces pension expenditure (-0.7p.p) while the symmetric scenario increases it (+0.9p.p);
- higher life expectancy increases pension expenditure (on average 0.7p.p);
- both the lower fertility scenario and the risk scenario tend to increase pension expenditures (0.5p.p on average) while higher employment of older workers has the opposite effect with the same average.

In what concerns a sensibility analysis on occupational schemes, due to the low share of the total expenditure over GDP, there are no significant effects.

Regarding poverty among Portuguese citizens, in particular in retirement, (INE, 2021) shows that the at-risk-of-poverty rate in 2019, after social transfers, was 15.7%, see Figure 5.

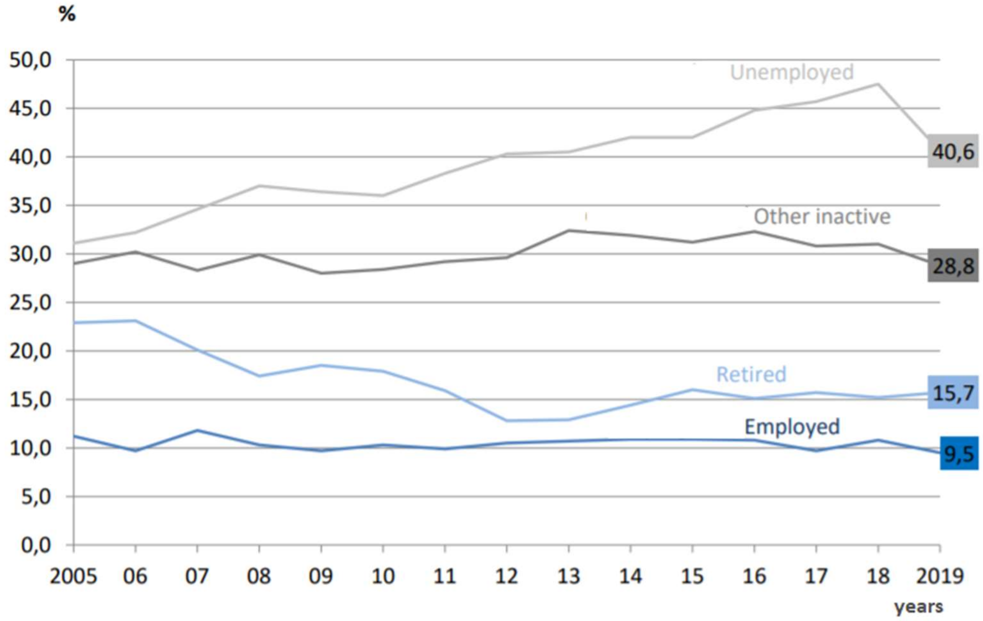


Figure 5. At-risk-of-poverty rate (2015-2019)
Source: (INE, 2021)

Chapter III

Pan-European Pension Product

This chapter aims to fully present and discuss the Pan-European Pension Product (PEPP). Since it is a new product, there is still very scarce bibliography on the topic. For this reason, the main source of the chapter is (European Parliament & Council, 2019) - *REGULATION (EU) 2019/1238 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 June 2019 on a pan-European Personal Pension Product (PEPP).*[3]

According to Gabriel Bernardino, former Chairman of EIOPA, "the current landscape of supplementary pension vehicles in the EU is complex, fragmented, not transparent and often very costly". Consequently, in some countries, the need to dedicate more attention to the development of good supplementary pensions arises. Furthermore, the reality around the world shows that systems that are more capable of providing high coverage and adequate pensions combine pillars of public social security, occupational pensions and private personal pensions. (APFIPP, 2021)

3.1 PEPP History: from the first steps to the "Regulation"

The Pan-European personal Pension Product is a portable, non-professional, individual retirement product that aims to address the problems of an ageing Union. It is a voluntary personal pension scheme that will complement existing public and occupational pension systems, as well as national private pension schemes, being inserted in the third Pillar.

PEPP comes also as an opportunity for the financial market providers, such as insurers, asset managers, pension funds and banks. It brings the chance to innovate in terms of long-term investment strategy and risk mitigation techniques and to engage with new customers, particularly young people and mobile workers and, as stated in (European Parliament & Council, 2019), p. 2, "will help to further facilitate the right of Union citizens to live and work across the Union".

In the *Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on a pan-European Personal Pension Product (PEPP),* made in 2017, see (European Commission, 2017b), there is an explanation on how it was important to create a new personal pension product. It clearly states that, besides investing in real estate, life

[3] See https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R1238&from=EN

insurance and other long-term investment products, individuals could opt for personal pension products. However, as it reads on page 2 of the document, the personal pension markets “are unequally developed and personal pension products are unequally affordable across the European Union”. And, in order to allow for individuals who wish to use this additional saving option, a pan-European framework for pension would be developed. It should not replace the existing national personal pension schemes, but rather offer individuals a new voluntary framework for saving.

In this Regulation (p. 2), is recalled that “The Commission’s Action Plan on Capital Markets Union of September 2015 stated that, ‘an “opt in” European Personal Pension could provide a regulatory template, based on an appropriate level of consumer protection, that pension providers could elect to use when offering products across the EU. A larger, “third pillar” European pension market would also support the supply of funds for institutional investors and investment into the real economy’”, see (European Commission, 2015), p. 19.

In the Commission’s Action Plan, it was also declared that it will ‘assess the case for a policy framework to establish a successful European market for simple, efficient and competitive personal pensions, and determine whether EU legislation is required to underpin this market’ cf. (European Parliament & Council, 2019), p. 3 and (European Commission, 2015), p. 19. To the best knowledge of the author this was the first step for the proposal of the PEPP.

Following the announcement in (European Commission, 2015), in its Resolution of 19 January 2016, the European Parliament voiced concerns over the lack of attractive and available risk appropriate long-term investments, together with cost efficient and suitable savings products for citizens. While emphasizing the need for alternatives in investor and consumer options, the European Parliament underlined that ‘an environment must be fostered that stimulates financial product innovation, creating more diversity and benefits for the real economy and providing enhanced incentives for investments, and that may also contribute to the delivery of adequate, safe and sustainable pensions, such as, for example, the development of a pan-European Pension Product (PEPP), with a simple transparent design’, cf. (European Parliament & Council, 2019), p. 3 and (European Parliament, 2018), p. 28.

In June 2016, the European Council called for ‘swift and determined progress to ensure easier access to finance for business and to support investment in the real economy by moving forward with the Capital Markets Union agenda.’ (European Council, 2016), pages 4 - 5.

In September of the same year, cf. (European Commission, 2016), p. 4, in its Communication Capital Markets Union — Accelerating Reform, considering the strong support demonstrated by the European Parliament, Council and stakeholders for the Capital Markets Union action plan, it will ‘consider proposals for a simple, efficient and competitive EU personal pension product’.

Subsequently, in its Communication Mid-term Review of the Capital Markets Union Action Plan, (European Commission, 2017a), the Commission expressed the intention to quickly move forward with three legislative proposals, which are central to the creation of the Capital Markets Union for all Member States. The second one is a proposal on a Pan-European Personal Pension Product, that will “lay the foundations for a safer, more cost-efficient and transparent market in affordable and voluntary personal pension savings that can be managed on a pan-European scale”, see p. 6 of the document. The four main goals of the creation of such product are highlighted:

1. To help people wishing to enhance the adequacy of their retirement savings to meet their needs;
2. To help addressing the demographical challenge;
3. To complement the existing pension products and schemes;
4. To offer good opportunities for long-term investment of personal pensions, promoting that way their cost-efficiency tradeoff.

Following negotiations, an agreement was reached on the legislative proposal. Subsequently, it was approved by the Parliament on 4 April 2019 and by the Council on 14 June 2019. The final act was signed on 20 June 2019. The result is “the Regulation” (European Parliament & Council, 2019) that is in fact the main source of this entire chapter. In the next section the main aspects of this document will be presented and discussed.

3.2 The "Regulation"

Because the creation of a Pan-European product like this is an ambitious project, a great number of issues had to be anticipated by the legislators. Only the main ones are presented here, but the interested reader can find all the details in the cited references.

3.2.1 Registration and distribution

Before these new products are spread in the EU, one key aspect is the fact that the PEPP Regulation (Article 13) requires each product to be registered in a central public register, which will be kept by EIOPA, and will be valid throughout the European Union.

According to Article 6 of the Regulation, only the following financial undertakings, authorised or registered under Union law, may apply for registration of a PEPP:

(a) credit institutions authorised in accordance with Directive 2013/36/EU of the European Parliament and of the Council;

(b) insurance undertakings authorised in accordance with Directive 2009/138/EC of the European Parliament and of the Council, engaged in direct life insurance according to Article 2(3) of Directive 2009/138/EC and Annex II to that Directive;

(c) institutions for occupational retirement provision (IORPs) authorised or registered in accordance with Directive (EU) 2016/2341 which, pursuant to national law, are authorised and supervised to provide also personal pension products. In that case, all assets and liabilities corresponding to PEPP provision business shall be ring-fenced, without any possibility to transfer them to the other retirement provision business of the institution;

(d) investment firms authorised in accordance with Directive 2014/65/EU, providing portfolio management;

(e) investment companies or management companies authorised in accordance with Directive 2009/65/EC;

(f) EU alternative investment fund managers (EU AIFM) authorised in accordance with Directive 2011/61/EU.

Although the register will be maintained by EIOPA, the request will have to be forwarded by the competent national authorities, ASF in Portugal.

National authorities will have up to three months to deliberate on the registration application and, if accepted, they must communicate their decision to EIOPA within five working days and inform the applicant. Once the PEPP is entered in the EIOPA public register, the competent authorities must inform providers that the PEPP may start to be marketed. According to the Regulation, this process could take around four months.

After registration, distribution follows and the product can consequently be marketed not only by insurance companies, but also by credit institutions (IORPs) that are authorized to sell individual pension plans and by other investment companies. Financial undertakings referred to in Article 6 of the Regulation may not only distribute PEPPs they have manufactured but also PEPPs they have not designed themselves. Naturally, "PEPP distributors should distribute only those products for which they have the appropriate knowledge and competence in accordance with the relevant sectorial law", as stated in the Regulation.

3.2.2 Investment options: Basic PEPP and other options

In order to keep the PEPP simple and transparent, the Regulation limits the number of investment options that can be offered within each PEPP to a maximum of six options, adapting each one to a specific segment, through different investment strategies or guarantees. Also, savers are able to change their option, with no cost involved, every five years.

Of the six investment options, one should be the default investment option - the Basic PEPP.

- **Basic PEPP**

This one should have a risk mitigation mechanism in order to allow investors to recover their capital. It can take the form of a risk mitigation technique, consistent with the objective of allowing the PEPP saver to recover capital, or a guarantee on the invested capital that must be due at the start of the payment phase and during the payment phase, if applicable.

This is also intended to be a simple, transparent and cost-efficient option. The Regulation limits the total costs to be charged to 1% of the accumulated capital per year, in which are included administrative, investment and distribution costs. Costs related to portability services or with capital guarantees not subject to such restriction are not included.

- **Other investment options**

With regard to the other possible options (a maximum of five additional to the Basic PEPP), all shall be provided on the basis of a guarantee or risk mitigation technique, in order to ensure sufficient protection for PEPP savers (see Subsection 2.2.4).

After a period of five years from the conclusion of the PEPP contract, PEPP savers are able to change their investment options, if they wish to do so, once the PEPP provider offers alternative investment options; in case of several changes, the next alteration can take place five years after the last one. The PEPP provider may consent the PEPP saver to alter the chosen investment option more often.

3.2.3 Investment rules for PEPP providers

PEPP providers must invest the assets corresponding to the PEPP according to the "prudent person" rule, where they shall take into consideration all the risks involved and the potential long-term impact of investment decisions on ESG factors.

Summarizing the rules in Article 41 of the Regulation, we have that the funds shall be invested in the long-term interests that best suit the PEPP saver and in order to ensure the safe, quality, liquidity and profitability of the portfolio as a whole. Investments should be made mainly on regulated markets. Investments in non-cooperative jurisdictions for tax purposes, recognized in the applicable Council's conclusions on the list of non-cooperative jurisdictions for tax purposes (European Council, 2021), are not allowed. Investments in high-risk third countries with strategic shortcomings identified by the applicable Commission Delegated Regulation, adopted on the basis of Article 9 of Directive (EU) 2015/849 (European Parliament & Council, 2015), are also not allowed.

Besides, the portfolio of assets shall be diversified in order to avoid too much reliance on any particular asset, issuer or group of undertakings and accumulations of risk in the portfolio.

3.2.4 Risk-mitigation techniques

Risk-mitigation techniques are *techniques for a systematic reduction in the extent of exposure to a risk and/or the likelihood of its occurrence*, cf. the Regulation, p. 18. As can be read in Article 46, the applicable risk-mitigation techniques may contain, among others, provisions:

(a) to gradually adapt the investment allocation to mitigate the financial risks of investments for cohorts corresponding to the remaining duration (life-cycling);

(b) that mitigate investment losses, create reserves from investment returns or contributions which will be allocated to PEPP savers in a fair and transparent manner;

(c) or, for using proper guarantees to protect against investment losses.

EIOPA, after consulting the other European Supervisory Authorities (ESAs) and conducting industry testing, had to develop draft regulatory technical standards[4] specifying the minimum criteria that the risk-mitigation techniques must satisfy, considering the several types of PEPPs and their characteristics, as well as the different types of PEPP providers and the differences between their regimes. EIOPA had to submit those draft regulatory technical standards to the Commission by 15 August 2020. This document supplements the Regulation, and was made also to ensure the consistent application of this Article.

For more detailed information on the three applicable risk-mitigation techniques cited before, see this supplementing document (European Commission, 2020a), pages 13-15.

3.2.5 Conduct and information documents

A PEPP should be subject to a contract made between the PEPP saver and the PEPP provider: the "PEPP contract". The contract must include, among others, a description of all investment options and the conditions related to the change of the investment option, the biometric risks in case they are offered and a description of the benefits and costs (cf. Article 4 of the Regulation).

Before signing the contract, savers must receive an advice on the PEPP and/or investment option that best suits their personal characteristics and that would best meet their demands and needs. As stated in the Regulation, p. 6, "Advice should particularly aim at informing a PEPP saver about the features of the investment options, the level of capital protection and the forms of out-payments."

Besides the advice, there are two standardized information documents that must be provided to savers: the "PEPP Key Information Document" (PEPP KID) and the "Benefit Statement" with clear definition of all costs involved in order to keep the PEPP as transparent as it is intended to be.

[4] See https://www.eiopa.europa.eu/sites/default/files/publications/eiopa-20-500_pepp_draft_rtss.pdf

- **PEPP KID**

The PEPP KID embodies pre-contractual information and shall provide key information. Summarizing, this document must contain the name of the PEPP, whether it is a Basic PEPP or not; the identity, contact details and information about the competent authorities of the PEPP provider; the registration number of the PEPP in the central public register and the date of the document; its long-term objectives and the way to reach them, including a description of the underlying instruments or reference values, and in which markets the PEPP provider invests, as well as an explanation of how the return is calculated; information on the portability service; all costs associated with an investment in the PEPP, among others. (See Appendix A – Table 1A)

In case there are several investment options, a generic PEPP KID must be provided with a basic description of the alternative investment options and stating where and how more detailed pre-contractual information relating to the investments backing those options can be found, or, alternatively, a stand-alone PEPP KID for each investment option (if the required information on the alternative investment options cannot be provided in a single PEPP KID). A separate PEPP KID shall be developed for the Basic PEPP.

- **Benefit Statement**

The Benefit Statement document is a concise document to be provided, annually, during the accumulation phase, containing key information that takes into consideration the specific nature of national pension systems and of any relevant laws, including national social, labour and tax laws. The information in this document must itemize all existing sub-accounts and must contain, among others, expected benefits at the time, contributions paid and costs incurred over the past 12 months. Articles 36 and 37 of the Regulation detailed the features of the Statement. (See Appendix A – Table 2A)

3.2.6 Portability

Currently, the internal market for personal pension products does not work well. In some Member States, there is still no market for personal pension products. In other, personal pension products are available, but there is a huge fragmentation between national markets. Consequently, pension products have only a limited degree of portability, cf. p. 2 of the Regulation.

The goal behind this project is to allow savers of this new product to keep saving towards their pensions, even in the event of moving to another Member State of the European Union.

In order to guarantee this purpose, the Regulation stipulates that, three years after its application, each PEPP provider must offer sub-accounts in at least two Member States, upon request by the savers, so that they can enjoy the service of portability: "…the obligation to provide PEPPs comprising sub-accounts for at least two Member States should apply within three years of the date of application of this Regulation", cf. p. 6.

Furthermore, PEPP providers should always deliver information on which sub-accounts are available upon launching the product, in order to avoid a possible misleading of PEPP savers. In case the PEPP saver decides to open a sub-account, the PEPP saver shall provide, among other, its new Member State of residence and the date from which the contributions shall be directed to the new account.

In the case where a PEPP saver moves to another Member State and there is not a sub-account available for that Member State, the PEPP saver should be able to switch without delay or costs to another PEPP provider which provides a sub-account for that Member State. Besides, the PEPP saver can maintain contributions made prior to residency changes to the previous sub-account.

3.2.7 Other topics

A number of other topics are covered in the Regulation, namely: Deregistration of a PEPP (Article 8); Detailed information on the sub-accounts of the PEPP and their opening (Articles 19 and 20); Distribution regime applicable to the various types of PEPP providers and distributors (Article 23); General provisions on reporting to national authorities (Article 40); Coverage of biometric risks (Article 49); Complaints (Article 50); Switching of PEPP providers (Articles 52-54); Decumulation phase (Articles 57-60); Supervision (Articles 61-66) and Penalties (Articles 67-70).

In this subsection there will be highlighted only two, switching of providers and decumulation phase, more relevant for the development of the work.

- **Switching of PEPP providers**

PEPP providers shall guarantee a switching service, when requested by the PEPP saver.

The PEPP saver has the right to switch providers during either the accumulation phase or the decumulation phase of the PEPP.

Once using the switching service, the transferring PEPP provider shall transfer all information related to all sub-accounts of the prior PEPP account, including reporting requirements, to the receiving PEPP provider. The receiving PEPP provider shall register that information in the corresponding sub-accounts.

There can be a domestic switching, when the PEPP saver requests to switch to a PEPP provider established in the same Member State or a cross-border switching, when in a different Member State.

Although the PEPP provider may allow the PEPP saver to change PEPP providers more frequently, the PEPP saver has the right to switch PEPP providers, if intended to, after a minimum of five years from the conclusion of the PEPP contract, and, in case of subsequent switching, after five years from the most recent change, cf. p. 49 of the Regulation.

The total costs applied to the switching service shall be limited to the actual administrative costs incurred by the PEPP provider and shall not exceed 0,5 % of the corresponding amounts/ monetary value of the assets-in-kind to be transferred to the receiving PEPP provider.

- **Decumulation phase**

The decumulation phase is the period during which assets accumulated in a PEPP account (in the accumulation phase) can be used to supply retirement or other income requirements.

Conditions such as the setting of the minimum age for the start of the decumulation phase or of a maximum period before reaching the retirement age for joining a PEPP and the out-payments of the national sub-accounts are determined by the Member States, unless they are specified in the Regulation.

As stated in the Article 58 of the Regulation, PEPP providers shall make available to PEPP savers the following forms of out-payments:

(a) annuities; fixed sums of money paid each year, usually permanently

(b) lump sum; a single payment made at a particular time

(c) drawdown payments; discretionary amounts which PEPP beneficiaries may draw up to a certain limit on a periodic basis

(d) combinations of the above form.

Although the PEPP savers shall choose the form of out-payments when they conclude a PEPP contract and when they request an opening of a new sub-account, they are allowed to modify it in order to be able to best adapt their pay-out choice to their needs when they retire. This can be done one year before the start of the decumulation phase; at the start of the decumulation phase; or, at the moment of switching. Different sub-accounts may have different ways of out-payments.

Chapter IV
PEPP vs CA PPR [CAPITAL]

Retirement Savings Plan (RSP) (*Plano de Poupança Reforma* - PPR in Portuguese) is a product which has been sold in the market for many years. According to (Jornal Económico, 2020), the PPR tax benefits were an important selling point in the beginning and have attracted families to choose this product when saving for retirement. Although it remains an interesting financial product to invest in the long term, with the successive changes in the PPR legislation, it has become less attractive due to the reduction of tax benefits.

4.1 Retirement Savings Plan in Portugal (PPR)

According to (Ministério das Finanças, 1989), PPR were created in 1989, in Portugal, with the objective of encouraging long-term savings, complementing the social security schemes provided by the State, and guaranteeing a retirement supplement for subscribers. PPR are constituted by nominative certificates from a retirement savings fund (*Fundo de Poupança-Reforma* – FPR, in Portuguese), which is in fact an investment fund, a pension fund or similar. FPR certificates can be subscribed by individuals or by employers on behalf of their employees and may represent several units of FPR participation, whole or fractional, which may or may not be dematerialized.

Decreto-Lei n.º 205/89 of 27 June, where the creation of PPR is established, was later completed by *Decreto-Lei n.º* 145/90, of 7 May (Ministério das Finanças, 1990) and updated 12 years after this, by *Decreto-Lei n.º* 158/2002, of 2 July, see (Ministério das Finanças, 2002) and (Comissão do Mercado de Valores Mobiliários, 2002).

Articles 2 and 3 of *Decreto-Lei n.º* 158/2002 are very important, as they set the entities authorized to manage the FPR and the composition of the fund, respectively. In short, the FPR management companies may be: (i) companies managing investment funds; (ii) pension fund management entities; (iii) or insurance life companies, provided they are all authorized under the law. Each management entity can manage one or more savings funds and it cannot be dissolved without first having guaranteed the continuity of the management of the funds by another authorized entity. In the composition of the assets, the management entities must take into account the purposes of the funds, ensuring compliance with the principle of risk dispersion, as well as the safety, income and liquidity of the investments made. The assets take the form of securities, participation in collective investment institutions, instruments representing short-term debt, bank deposits or other assets of monetary nature. When taking the form of a pension fund or a life insurance autonomous fund, besides the assets mentioned already, land, buildings and credits arising from mortgage loans are also permitted.

4.1.1 Refund of certificates

The capitalized value of the certificates may be reimbursed to the participants in the following cases: (a) Retirement due to old age; (b) Long-term unemployment; (c) Permanent incapacity for work, whatever the cause; (d) Serious illness; (e) From 60 years of age; (f) Attendance or admission in a vocational or higher education course, when generating expenses in the respective year; (g) Use for the payment of credit agreements guaranteed by mortgage on property intended for the participant's own and permanent residence. Parts (b), (c), (d) and (f) cover the participant and any of the members of the household. Reimbursement made under a), e), f) and g) can only be verified provided that five years have elapsed after the beginning of the subscription.

In the event of the participant's death, reimbursement may be demanded by the heirs. Participants, or heirs, may choose to refund all or part of the certificates periodically or not; monthly life pension; or, any composition of the two previous modalities.

For more exhaustive information on this, see Article 4 of (Comissão do Mercado de Valores Mobiliários, 2002).

4.1.2 Tax regime

Regarding the tax regime, in accordance with Article 8 of (Ministério das Finanças, 1989) and Article 8 of (Ministério das Finanças, 1990), we have the following:

- FPR earnings are exempt from corporate income tax (*Imposto sobre o Rendimento Coletivo* - IRC in Portuguese);
- For personal income tax (*Imposto sobre o Rendimento das Pessoas Singulares* - IRS in Portuguese) purposes, the amount applied in the respective year in PPR is deductible from the taxable income, with a maximum fixed limit.
- Refund of FPR certificates is subject to IRS under the following terms: (a) In accordance with the rules applicable to the pensions income (category H of the IRS

Code), when its perception occurs in the form of annuities; (b) At the rate corresponding to one-fifth of its value, in case of full redemption; (c) In accordance with the rules established in (a) and (b) regarding the respective share of the income, in cases where the modalities referred to therein are simultaneously verified.

- Transmissions, upon death, of the accumulated amounts allocated to a PPR, in favor of the surviving spouse, children or adopted persons (in the case of full adoption), are exempt from the tax on inheritances and donations.

4.2 CA PPR [CAPITAL]

This section follows the Pre – Contractual Information and Technical Data Sheet of the product CA PPR [CAPITAL] used in the company CA *Vida*. It aims to present the product marketed by the company.

4.2.1 Product characterization

CA PPR [CAPITAL] is a life insurance retirement product, with a guarantee of the invested capital. It is intended for adults, preferably between 40 and 65 years of age with savings/investment capacity.

The accumulated guaranteed capital is paid under the following situations:

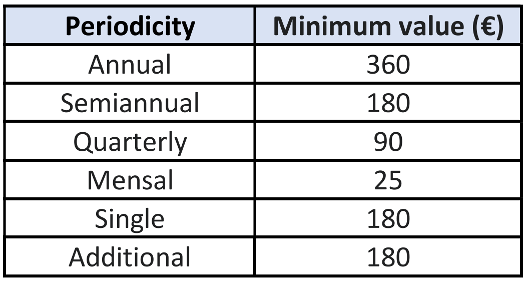
(1) Retirement due to old age or after the age of 60 of the Insured Person or Spouse (if the PPR is a common property of the couple) and provided that the contract has been in force for at least five years;

(2) In case of professional incapacity, prolonged unemployment or serious illness, by any of the members of the Household;

(3) In case of death of the Insured Person or Spouse.

4.2.2 Subscription conditions

- The minimum term is five years;
- At the beginning of each year, CA *Vida* sets the minimum interest rate for that calendar year;
- Premiums/minimum deliveries (Table 1)



Periodicity	Minimum value (€)
Annual	360
Semiannual	180
Quarterly	90
Mensal	25
Single	180
Additional	180

Table 1. Premiums/minimum deliveries
Source: (CA Vida, 2021a)

- The accumulated capital at a given point in time t is

$$C(t) = C(t-1) + P(t) + I(t) - R(t), \qquad (1)$$

  where $C(t-1)$ is the accumulated capital from the previous year, $P(t)$ is the amount of premiums in the current year, $I(t)$ is the amount of income in the current year and $R(t)$ is the amount of refunds made in the current year.
- At any time during the contract, it is possible to redeem in part or in full. After the partial redemption, the remaining amount of the accumulated capital cannot be less than €200.
- Charges:
  - Subscription: 0%;
  - Reimbursement: In case of redemption, the fixed penalty to be applied will be 2% on the amount to be redeemed;
  - Transfer: In case of transfer to another management entity, a commission of 0.5% is deducted from the total transferred.
- Beneficiaries are the insured person, during lifetime, or the heirs or designated beneficiaries, in the event of death.

4.2.3 Tax conditions

In situations defined by law (Ministério das Finanças, 2002), even in the case of Death, the income is taxed at the effective rate of 8%. This PPR income taxation also applies to deliveries made less than five years ago, provided that the first delivery has been made more than five years ago and at least 35% of all deliveries have been made in the first half of the term of the contract. Cases covered are:

(1) Retirement due to old age or age equal to or greater than 60 years of the Insured Person, or his/her spouse when the PPR is a common property of the couple;

(2) Long-term unemployment, permanent incapacity for work or serious illness of the Insured Person or any member of the household, when the person in whose conditions the reimbursement request is based was found, on the date of each delivery in the respective situation.

Outside these situations, the applicable taxation regime is as follows: 21.5% during the first five years, 17.2% between the fifth and eighth year and 8.6% from the eighth year, provided that at least 35% of all deliveries have been made in the first half of the term of the contract.

4.2.4 Characterization of a typical CA *Vida* client

The typical client of the life insurance company *CA Vida* is the client of the national bank *Crédito Agrícola*. This is a conservative client, investing less in risky products and more in products intended for clients with a prudent risk profile or with guaranteed capital. This conclusion results from the analysis of the portfolio of pension funds products, for years 2019-2021. Clients can choose, in the same contract, to distribute their investment among three different funds:

- *CA Reforma Mais* is intended for clients with a less risk-averse risk profile.
- *CA Reforma Tranquila* is aimed at clients with a moderate risk profile.
- *CA Reforma Segura* is intended for clients with a prudent risk profile (more risk-averse).

Tables 2, 3 and 4 below are very elucidative.

Age group	***CA Reforma Mais***		***CA Reforma Tranquila***		***CA Reforma Segura***	
	Value	**%**	**Value**	**%**	**Value**	**%**
<18	1	0.00%	1	0.00%	1	0.00%
[18-30[	103	0.50%	153	0.74%	153	0.74%
[30-45[	792	3.85%	1214	5.91%	1274	6.20%
[45-65[	2198	10.69%	3922	19.08%	4286	20.85%
>65	1113	5.42%	2326	11.32%	3017	14.68%
Total	4207	20.47%	7616	37.05%	8731	42.48%

Table 2. Policies in force and % over the total number for pension funds until 2019, per age group
Source: (CA Vida, 2021b)

Age group	*CA Reforma Mais*		*CA Reforma Tranquila*		*CA Reforma Segura*	
	Value	%	Value	%	Value	%
<18	1	0.00%	1	0.00%	1	0.00%
[18-30[	121	0.51%	174	0.74%	164	0.70%
[30-45[	856	3.64%	1327	5.64%	1431	6.09%
[45-65[	2583	10.99%	4435	18.87%	4860	20.67%
>65	1368	5.82%	2703	11.50%	3484	14.82%
Total	4929	20.97%	8640	36.75%	9940	42.28%

Table 3. Policies in force and % over the total number for pension funds until 2020, per age group
Source: (CA Vida, 2021b)

Age group	*CA Reforma Mais*		*CA Reforma Tranquila*		*CA Reforma Segura*	
	Value	%	Value	%	Value	%
<18	2	0.01%	3	0.01%	6	0.02%
[18-30[	127	0.50%	182	0.71%	180	0.70%
[30-45[	902	3.53%	1400	5.48%	1549	6.06%
[45-65[	2787	10.91%	4697	18.39%	5212	20.40%
>65	1538	6.02%	3024	11.84%	3939	15.42%
Total	5356	20.96%	9306	36.43%	10886	42.61%

Table 4. Policies in force and % over the total number for pension funds until June 2021, per age group
Source: (CA Vida, 2021b)

Also, when comparing the portfolio values of a risk product (*CA Vida Unit*) with the values of the pension funds mentioned as a whole, it is clear that there are significantly more policies regarding pension funds (Table 5).

Age group	*CA Vida Unit*			Pension Funds		
	2019	2020	June 2021	2019	2020	June 2021
<18	0	0	0	2	1	7
[18-30[	4	4	4	246	269	284
[30-45[	11	15	19	2114	2302	2417
[45-65[	40	46	46	6552	7249	7687
>65	36	39	43	4079	4624	5112

Table 5. Policies in force CA Vida Unit vs Pension Funds (age group) (2019-2021)
Source: (CA Vida, 2021b)

Note that the distribution of clients per age in 2020 was: 16% for clients aged 18-30; 37% for clients aged 30-45; 41% for clients aged 45-65; 6% for clients older than 65. (Figure 6)

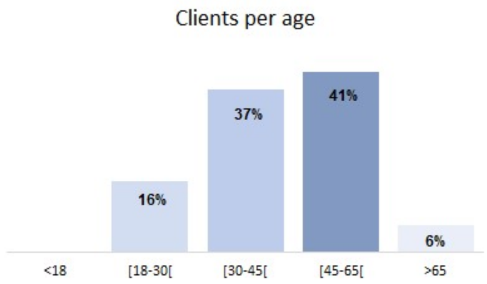


Figure 6. Clients (%) per age group (2020)
Source: (CA Vida, 2021b)

4.3 Profit Testing

The purpose of a profit test is to estimate the profit an insurer can expect from a contract at the end of each contract period. In this case we are taking a CA PPR [CAPITAL] contract, since it is the most similar to PEPP in its characteristics.

The first step is the construction of the projected revenue for each policy year. The components of the projected revenue are the cash flows related to the policy, which are calculated under the establishment of the technical basis of the contract.

Note that this is an adapted profit testing, using the company's template. Naturally, the template will not be disclosed, due to confidentiality reasons. The main objective of the exercise is to establish a profit benchmark, in case the company in fact considers the possibility of marketing the PEPP.

4.3.1 Technical basis

a) Mortality

The mortality assumptions used in the projection of cash flows were defined considering market and company data. Mortality was set to 20% of the GKM80 Table. (Table 6)

Age	20% GKM80	Age	20% GKM80	Age	20% GKM80	Age	20% GKM80
50	0.00134112	59	0.00321856	68	0.00773247	77	0.01790960
51	0.00147645	60	0.00354980	69	0.00851099	78	0.01957520
52	0.00162608	61	0.00391499	70	0.00936329	79	0.02137000
53	0.00179151	62	0.00431745	71	0.01029525	80	0.02329920
54	0.00197437	63	0.00476065	72	0.01131291	81	0.02536720
55	0.00217644	64	0.00524845	73	0.01242256	82	0.02757760
56	0.00239965	65	0.00578497	74	0.01363060	83	0.02993260
57	0.00264614	66	0.00637463	75	0.01494360	84	0.03243340
58	0.00291829	67	0.00702213	76	0.01636780	85	0.03507940

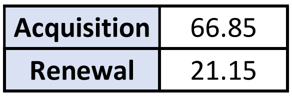
Table 6. Mortality assumptions, 2021
Source: (CA Vida, 2020c)

b) Expenses

The expense assumptions used in the cash flow projections are defined annually as the average of the expenses verified in the previous two years (2019 and 2020).

Expenses that are defined at the product level are introduced directly into the model without any type of treatment, such as commissions on premiums or mathematical provisions and fee on premiums for the Supervisor Authority (ASF). For expenses that are not defined at the product level, a study is carried out on the allocation of expenses by nature based on an allocation matrix (Appendix C – Table 1C). These include, among other personnel expenses, interest paid, taxes, and other fees.

The acquisition expenses refer to the first year of the contract, and renewal expenses refer to subsequent years. The expenses per policy, in euros, are presented in Table 7.



Acquisition	66.85
Renewal	21.15

Table 7. Expense assumptions (€), 2021
Source: (CA Vida, 2020c)

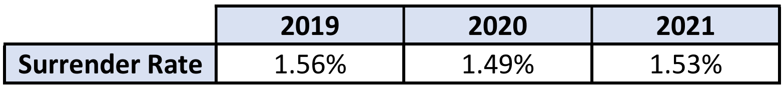
c) Surrender rate

Surrender rates are defined through yearly studies in which the number of cancelled policies is compared to the number of policies in force in each period. The results obtained are treated by product, and the average of surrender rates of the last two years is considered, in this case 2019 and 2020 (Table 8).

Regarding capitalization insurance like CA PPR [CAPITAL], discontinuity assumptions were considered for the following situations:

- Full Redemption
- Transfer

The surrender rates are in Table 8.



	2019	2020	2021
Surrender Rate	1.56%	1.49%	1.53%

Table 8. Surrender rate assumptions, 2019-2021
Source: (CA Vida, 2020c)

d) Interest rate

The discount rates used to discount cash flows are given by the interest rate curve derived by EIOPA[5] relative to 31 December 2020, including the volatility adjustment (Table 9). The time structure of interest rates used is in Table 9.

Year	Rate 2020	Year	Rate 2020	Year	Rate 2020
1	-0.553%	16	-0.096%	31	0.820%
2	-0.554%	17	-0.091%	32	0.894%
3	-0.538%	18	-0.081%	33	0.966%
4	-0.517%	19	-0.060%	34	1.036%
5	-0.488%	20	-0.023%	35	1.103%
6	-0.457%	21	0.031%	36	1.167%
7	-0.416%	22	0.098%	37	1.229%
8	-0.375%	23	0.172%	38	1.289%
9	-0.334%	24	0.252%	39	1.347%
10	-0.297%	25	0.334%	40	1.402%
11	-0.250%	26	0.417%	41	1.455%
12	-0.205%	27	0.501%	42	1.506%
13	-0.193%	28	0.583%	43	1.555%
14	-0.135%	29	0.664%	44	1.602%
15	-0.104%	30	0.743%	45	1.648%

Table 9. Interest rate assumptions, 2021
Source: (CA Vida, 2020c)

4.3.2 Other assumptions

Besides the technical basis presented above, other assumptions have been made in order to do the test. As a result, we considered a standard policy with average values, where the insured person is 53 years old (value calculated based on the average age of people with policies for the product in question) and the amount invested was 10500€ (average value of the amount invested in the CA PPR [CAPITAL]).

The minimum term of the contract is seven years, for the policyholder to reach 60 years of age at the end of the contract.

The technical interest rate was fixed at 0.6%, computed as the average of the rates used for years 2015-2019 (2020 did not count for the average because it had an atypical value).

[5] See https://www.eiopa.europa.eu/tools-and-data/risk-free-interest-rate-term-structures_en

The rate of return on assets was fixed at 0.7%. It was an assumption provided by the company's asset manager.

4.3.3 Construction of the projected revenue for each policy year

The first step is to construct a multiple decrement table, as the population is subject to more than one decrement. In this case, these are two relevant decrements: death (d) and surrender (s). q_x^d is the independent rate of decrement d at age x, which corresponds to 20% of the GKM80 Table, and q_t^s is the independent rate of decrement s at contract year t, which is constant, in this case, and set at the value 1.53%, computed previously.

The multiple decrement table provides dependent rates, since the number of lives removed due to each decrement will depend on the preceding population as well as the number of lives removed by the other decrement (Institute and Faculty of Actuaries, 2019).

For the two-decrement (d,s) case, the dependent rates of decrement d and s are given by the following formulas, respectively:

$$(aq)_x^d = q_x^d\left(1-\frac{1}{2}q_x^s\right) \quad \text{and} \quad (aq)_x^s = q_x^s\left(1-\frac{1}{2}q_x^d\right) \qquad (2)$$

The probability of a policy in force at the beginning of policy year *t* surviving to the end of the year *t* is

$$(ap)_{x+t-1} = 1-[(aq)_{x+t-1}^d + (aq)_{x+t-1}^s] \qquad (3)$$

The cumulative probability of a policy in force at the outset of the contract surviving to the beginning of policy year $t = 2, \ldots$ is

$${}_{t-1}(ap)_x = {}_{t-2}(ap)_x \times (ap)_{x+t-2}, \ {}_0(ap)_x = 1 \qquad (4)$$

After building the multi-decrement table, and given all the assumptions on the contract, calculations are performed to find the profit vector$(PRO)_t$, which is the vector of balancing item in the projected revenue for each policy year. It gives the expected profit at the end of each year per policy, assuming that the policy is in force at the beginning of the year. Further details are in (Institute and Faculty of Actuaries, 2019)

The profit margin is computed using the following formula:

$$Profit\ Margin = \frac{\sum_{t=1}^{n} \frac{(PS)_t}{(1+i_t)^t}}{\sum_{t=1}^{n} \frac{{}_t p_t \times P_t}{(1+i_t)^{(t-1)}}} \quad , \tag{5}$$

where $(PS)_t$ is the profit signature, equal to the product of the each component of $(PRO)_t$ by the corresponding surviving probability. Premium P_t in year t is assumed to be fully paid at the beginning of the policy year. The profit margin is then the expected Net Present Value of the profit signature, expressed as a percentage of the expected NPV of the premium income.

The profit margin obtained, in this case, was of 5.242%.

Considering that most of the assumptions made will also apply to the PEPP, this value shows that the product may not be satisfactorily profitable, thus not being very interesting to the company, from a profit point of view**.** However, from a customer's point of view, it can be a safe investment option, capable of attracting the typical CA *Vida*'s client with a more risk-averse profile.

4.4 Main similarities and differences

This section highlights some differences between PEPP and PPR products, following the report analysis and the webinar promoted by APFIPP, about "Pan-European Personal Pension Product | Major Challenges, Pros and Cons"[6]. (Miguel Rêgo, 2021)

Note that, the tax regimes have to be decided by each member state and countries have not decided yet about taxes framework that will be applied to the PEPP. So, due to the lack of information it is not possible to fully compare both products. However, is possible to highlight some differences:

(1) The guaranteed capital and limited cost on PEPP (in the investment option Basic PEPP), not mandatory in PPR. For instance, although CA *Vida* also has guaranteed capital for this product, the reimbursement and management charges do not have a maximum limit, being established by the company.

(2) Portability: savers will be able to continue saving in the same product even in the event of changing residence in the EU, which may be simpler for them;

[6] See https://www.apfipp.pt/backoffice/box/userfiles/file/Documentos%202021/Webinar_PEPP_20210616.mp4

(3) Consistent supervisor framework throughout different geographies which can give an additional level of confidence to the savers;

(4) PEPP supplies to the entire population, both in working age (whether they are employed or unemployed) and in retirement age. It is designed for all life cycle while PPR has a limit that is the retirement age.

The fact that the PEPP is designed as a digital product for safe terms and also removes barriers for the professional mobility within the European territory, makes this product more attractive for younger generations shaped by the international study programs such as Erasmus. So, the target of age is going to be decreased.

The two products are specifically directed to the retirement savings and although PEPP is coming as a new choice, the experts believe that both products can coexist since they are products with different features. So, final definitions of PEPP should follow a line of complementary with existing PPR's and not replacement. Thousands of consumers with regular savings in PPR exist for which expectations should be maintained, so to not keep the PPR available would be a mistake. (Miguel Rêgo, 2021)

Chapter V
Conclusions

Due to an aging global population, particularly in the European Union, a low pension coverage and the poverty amongst the elderly, the need to improve the pension systems is clear. Besides, innovating and marketing a new product brings, at least, more options to those who want to save up for the golden days.

Although the research and work done were limited to the short amount of data available, it is possible to highlight some particular PEPP characteristics, which are not present in the PPR, namely the portability, which brings a huge advantage for consumers who wish for the flexibility of having savings in another Member-State. Also, this product is designed in a more digitalized manner, which will possibly drive people to start investing in long-term savings sooner than they do now, for instance, with the PPR.

As CA PPR [CAPITAL] is the most similar product with the PEPP in its characteristics, a profit testing was done with the purpose of the company defining a profit benchmark for the possible marketing of the product. Results showed that, given the current market conditions and the negative interest rates, PEPP may not be satisfactorily profitable, thus not being very interesting to the company CA *Vida* from a profit point of view. However, it is not expected to be onerous.

On the other hand, from the customer's perspective, being a product with a capital guarantee option (Basic PEPP), it is a safe investment and it is likely to attract the typical client of the company with a more risk-averse profile. By attracting more costumers, more capital under management for the company would exist. Also, when the contract expires, this capital may be reinvested and it is possible that existing clients may subscribe other type of products offered by the company, such as traditional risk products, which are more profitable. So, in this respect, selling PEPP could be a good strategy, as a way of attracting and anchoring customers that can later purchase other sort of products. With such cons and pros, it is not an easy decision to make

The main limitation of this work was in fact the lack of information on the product, since it is neither available in the market nor totally defined. A future research question would be to track the performance of the product when it is implemented in the market, which requires being attentive to the evolution of this issue in the near future. In the meantime, companies may continue to carry out profit testing for various possible scenarios and profit criteria. After the PEPP’s adoption by the several European Member States, it would be interesting to study the product’s acceptance by customers throughout the years and verify if it shows to be a relevant product, or if it will follow the same path as the PPR, which have been losing adherence through the years, mainly due to the decrease in tax benefits and low return rates.

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APPENDIX

Appendix A – Informative documents on PEPP

PEPP KID

What is this product?	**i.** Title and explanatory statement contained in point 2 of Article 28 of the Regulation
	ii. Name of the PEPP, whether or not it is a base PEPP, information about the provider and respective competent authority, PEPP registration number in the central public register and date
	iii. The statement: "The retirement product described in this document is a long-term product with limited redeemability which cannot be terminated at any time."
	iv. Its long-term objectives and the means for achieving them, in which markets the investments are made and an explanation of the calculation of the return
	v. A description of the PEPP saver to whom the PEPP is intended, in particular, referring its capacity to withstand investment losses
	vi. Indication of whether Basic PEPP offers a capital guarantee or other technique that allows it to recover or, in the case of an investment option, which guarantees or techniques for reducing risk
	vii. A description of the PEPP retirement benefits, in particular the possible forms of out-payments and the right to modify the form of out-payments
	viii. Information on biometric risk coverage and respective insurance benefits, when applicable
	ix. Information on the service and portability and the EIOPA central register, where you can find information on the accumulation and payment phase defined by the Member States
	x. A statement on the consequences for the PEPP saver of early withdrawal from the PEPP, including all applicable fees, penalties, and possible loss of capital protection and of other possible advantages and incentives
	xi. A statement on the consequences for the PEPP saver if the PEPP saver stops contributing to the PEPP
	xii. Information on the sub-accounts available and the alternatives in case there is no sub-account in a Member State where the saver moves
	xiii. Mention of the right to change provider and right to information about the process
	xiv. The conditions for modification of the chosen investment option
	xv. Information on the performance of the PEPP provider's investments in terms of ESG factors
	xvi. Law applicable to the PEPP contract
	xvii. Reflection or cancellation period for PEPP savers

What are the risks and what could I get in return?	**xviii.** Brief description of the risk profile
	xix. Maximum potential loss of invested capital
	xx. What are the appropriate performance scenarios and their assumptions
	xxi. Return conditions or maximum return limits incorporated (include indication on the influence of tax law on return)
What happens if [name of the PEPP provider] is unable to pay out?	**xxii.** Description of a possible investor indemnity coverage/guarantee scheme for losses, when applicable
What are the costs?	**xxiii.** Costs associated with PEPP (direct and indirect costs, both unique and recurrent, to be supported by savers)
What are the specific requirements for the sub-account corresponding to [my Member State of residence]?	**xxiv.** Under a sub-section titled 'Requirements for the pay-in phase': a description of the conditions for the accumulation phase; Under a sub-section titled: 'Requirements for the pay-out phase': a description of the conditions for the decumulation phase, both determined by the Member State of residence of the PEPP saver
How can I complain?	**xxv.** Information on how and where a saver can file a complaint against a provider or distributor
	xxvi. Additional information, namely on the provider's accounts and investment policies

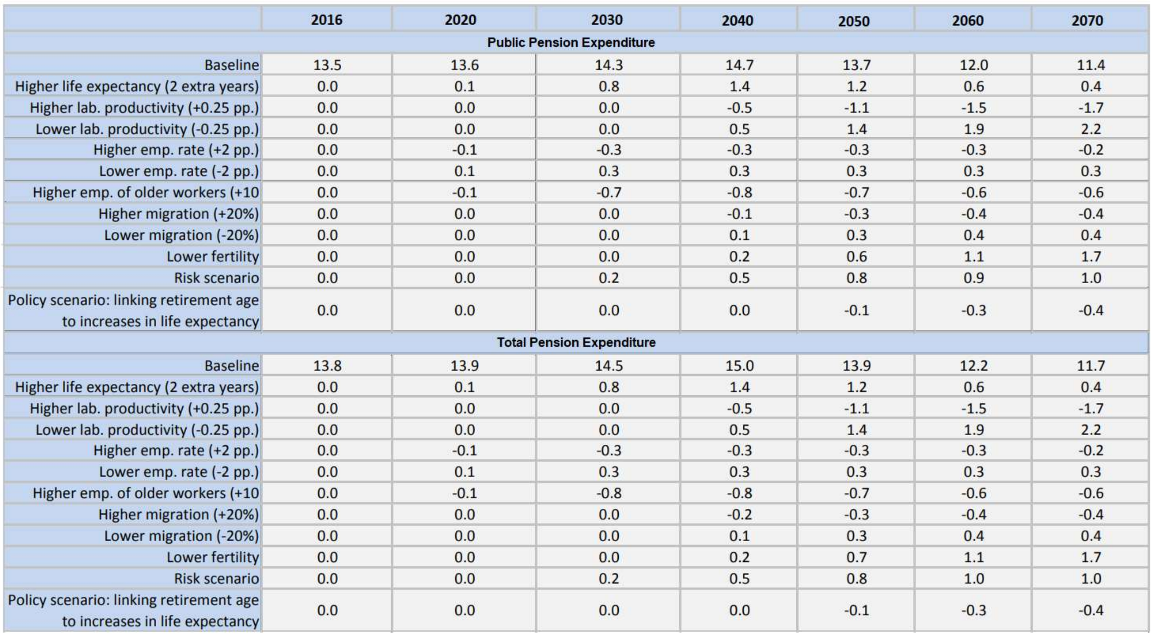
Table 1A: Elements to be included in the PEPP KID
Source: (European Parliament & Council, 2019)

PEPP Benefit Statement

i. Personal details of the PEPP saver and the earliest date on which the decumulation phase may start for any sub account
ii. The name and contact address of the PEPP provider and an identification of the PEPP contract
iii. The Member State in which the PEPP provider is authorised or registered and the names of the competent authorities
iv. information on pension benefit projections based on the date referred to in point (i), and a disclaimer that those projections may differ from the final value of the PEPP benefits received.
v. Information on the contributions paid by the PEPP saver or any third party into the PEPP account over the previous 12 months
vi. Description of the costs incurred in the last 12 months (management, asset safekeeping, related to portfolio transactions and others, and estimated final costs)
vii. The nature and the mechanism of the guarantee or risk mitigation techniques, if applicable
viii. The number and value of units corresponding to the PEPP saver's contributions over the previous 12 months, if applicable
ix. The total amount in the PEPP account of the PEPP saver on the date of the statement
x. Information on the past performance of the PEPP saver's investment option covering performance of a minimum of 10 years or, in cases where the PEPP has been provided for less than 10 years, covering all the years for which the PEPP has been provided
xi. For PEPP accounts with more than one sub-account, information in the PEPP Benefit Statement shall be broken down for all existing sub-accounts
xii. Summary information on the investment policy relating to ESG factors
xiii. How and where to get additional information

Table 2A: Elements to be included in the PEPP Benefit Statement
Source: (European Parliament & Council, 2019)

Appendix B - Public and total pension expenditures deviation



	2016	2020	2030	2040	2050	2060	2070
Public Pension Expenditure							
Baseline	13.5	13.6	14.3	14.7	13.7	12.0	11.4
Higher life expectancy (2 extra years)	0.0	0.1	0.8	1.4	1.2	0.6	0.4
Higher lab. productivity (+0.25 pp.)	0.0	0.0	0.0	-0.5	-1.1	-1.5	-1.7
Lower lab. productivity (-0.25 pp.)	0.0	0.0	0.0	0.5	1.4	1.9	2.2
Higher emp. rate (+2 pp.)	0.0	-0.1	-0.3	-0.3	-0.3	-0.3	-0.2
Lower emp. rate (-2 pp.)	0.0	0.1	0.3	0.3	0.3	0.3	0.3
Higher emp. of older workers (+10	0.0	-0.1	-0.7	-0.8	-0.7	-0.6	-0.6
Higher migration (+20%)	0.0	0.0	0.0	-0.1	-0.3	-0.4	-0.4
Lower migration (-20%)	0.0	0.0	0.0	0.1	0.3	0.4	0.4
Lower fertility	0.0	0.0	0.0	0.2	0.6	1.1	1.7
Risk scenario	0.0	0.0	0.2	0.5	0.8	0.9	1.0
Policy scenario: linking retirement age to increases in life expectancy	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.4
Total Pension Expenditure							
Baseline	13.8	13.9	14.5	15.0	13.9	12.2	11.7
Higher life expectancy (2 extra years)	0.0	0.1	0.8	1.4	1.2	0.6	0.4
Higher lab. productivity (+0.25 pp.)	0.0	0.0	0.0	-0.5	-1.1	-1.5	-1.7
Lower lab. productivity (-0.25 pp.)	0.0	0.0	0.0	0.5	1.4	1.9	2.2
Higher emp. rate (+2 pp.)	0.0	-0.1	-0.3	-0.3	-0.3	-0.3	-0.2
Lower emp. rate (-2 pp.)	0.0	0.1	0.3	0.3	0.3	0.3	0.3
Higher emp. of older workers (+10	0.0	-0.1	-0.8	-0.8	-0.7	-0.6	-0.6
Higher migration (+20%)	0.0	0.0	0.0	-0.2	-0.3	-0.4	-0.4
Lower migration (-20%)	0.0	0.0	0.0	0.1	0.3	0.4	0.4
Lower fertility	0.0	0.0	0.0	0.2	0.7	1.1	1.7
Risk scenario	0.0	0.0	0.2	0.5	0.8	1.0	1.0
Policy scenario: linking retirement age to increases in life expectancy	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.4

Table 1B: Public and total pension expenditures (% GDP) under different scenarios (deviation from the baseline in p.p.)
Source: (GPEARI, 2018)

Appendix C - Allocation matrix of expenses

	Claim Costs	Operating Costs			Investments
		Aquisition	Administrative	Pension Funds	
Personal expenses	9.00%	46.00%	40.00%	1.00%	4.00%
Supplies and External Services	7.50%	30.10%	56.10%	0.50%	5.80%
Taxes and fees			100.00%		
Financial depreciations and amortizations	14.00%	20.00%	60.00%	1.00%	5.00%
Other provisions			100.00%		
Interest incurred					100.00%
Commissions	30.00%		35.00%		35.00%

Table 1C: Allocation matrix of expenses, 2021
Source: (CA Vida, 2021c)