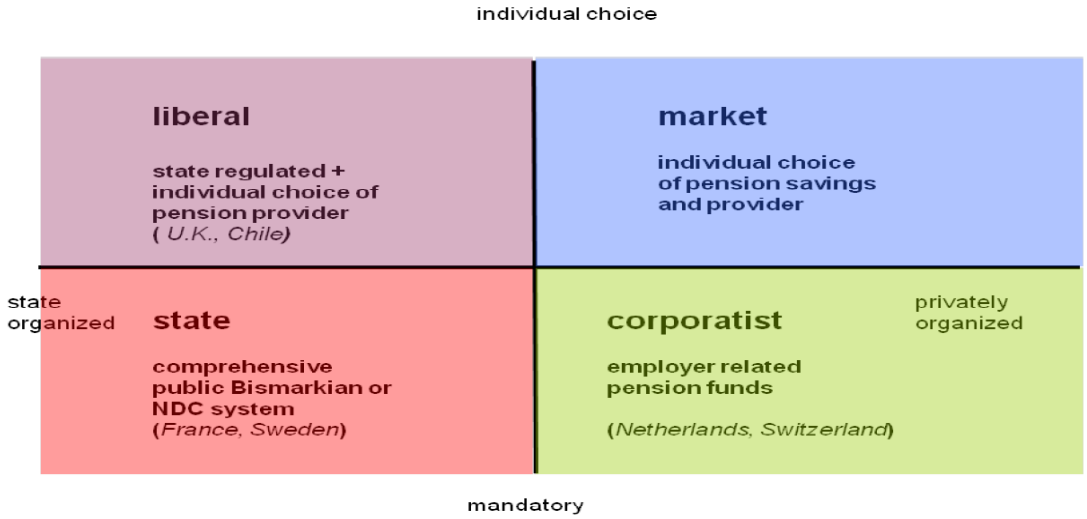
Contents

1. Introduction

In this short essay it will be demonstrated in a diligent way, a specific pension plan. This plan has been chosen from the paper of Garcia-Huitron and Ponds (2015) which concentrated to the funded pension plan diversity and variety throughout the world[1]. After research, the authors, based on the available options during the accumulation and decumulation procedures of the pension provisions and rights, identified four role models. From the twelve representative illustrated pension plans, among eleven countries, I decided to select and subsequently discuss in depth the case of the Netherlands' occupational pension system (second pillar).

Table 1: Typology of pension systems



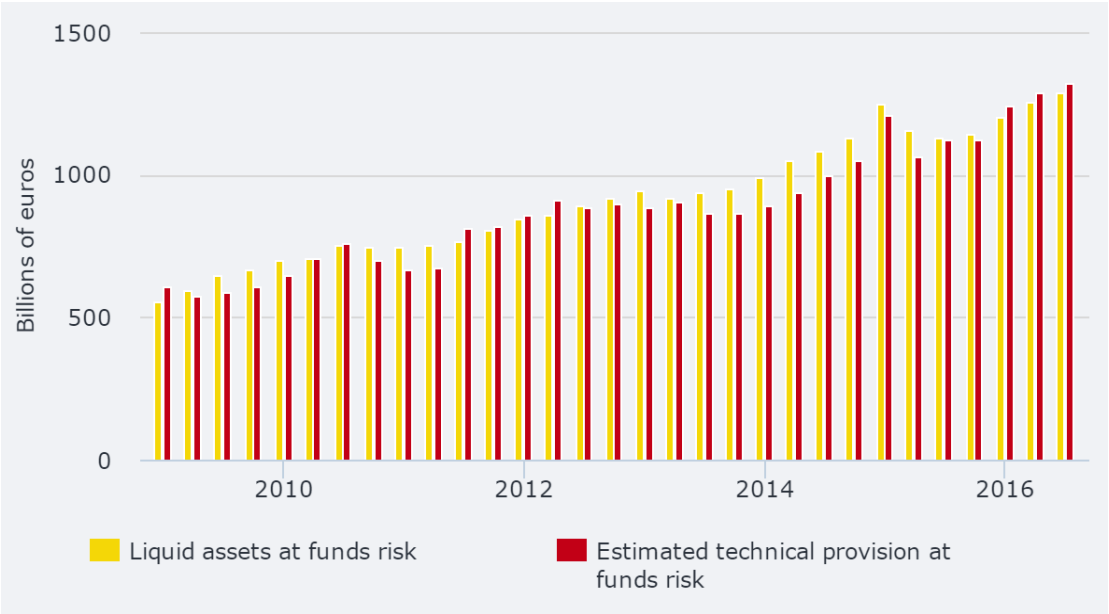
Source: Bovenberg and van Ewijk (2011)

In particular, the case of the Netherlands funded pension system serves as an example for the Delegated Choice Model. Very briefly, in the specific type of model the individual choice for retirement is determined on an institutional level and by trade unions and employers' associations, which are also called "social partners"(Garcia-Huitron and Ponds, 2015). In addition, the legal authority which serves as a supervisor of pension funds' solvency, in the occupational pension system is the Central Bank of the Netherlands (De Nederlandsche Bank).

Before, we proceed with the delineation of the Dutch occupational pension system, it has to be clarified why the Netherlands constitute an interesting case study and as a Delegated Choice Model for the specific essay. At first, there were quite a few discussions in the Netherlands and a heated-political debate over the direction of the transformation of occupational pension system, especially after the European debt crisis (in 2012) and the decreasing funding ratios of the pension funds. This is apparent, from figure 1 where it can be observed that, on average, the estimated technical provisions (liabilities) were higher than the assets in quite a few periods and consistently higher, approximately from 2015 and afterwards.

[1] Table 1 provides a few alternative typologies of alternative pension systems. The variety is quite salient among countries.

Figure 1: Estimates technical provision at pension funds' risk[2]



Source: De Nederlandsche Bank

Secondly, the case of the Netherlands holds a considerable interest because a few reforms have already taken place in the occupational pension system of the Netherlands, following the global trend of shifting from defined-benefit (DB) towards to more funded and defined-contribution (CDC or IDC) schemes in the second pillar. Moreover, since 2015 the Dutch government has adopted, and subsequently the pension funds, extensively collective defined-contributions schemes (CDC) in order to bolster the solvency of pension funds and tackle more effectively the macroeconomic risks that both pension funds and generations have to face, like inflation and longevity.

2. The Dutch Occupational Pension System in a nutshell

The Dutch occupational pension system consists of three pillars. The first one is a pay-as-you-go (PAYG) pension scheme. To be precise the type of first pillar is Beveridgean, which means that the public system provides a uniform and flat benefit to all citizens at a level that is related with the minimum wage. There are many reasons why countries have decided to adopt a Beveridge-type public pension scheme but the main reason is in order to provide a standard of living to the people during their retirement period. However, Garcia-Huitron and Ponds (2015) highlight that the selection between Birmackian and Beveridgean public pension plans is highly correlated with various cultural aspects like labor history, societal level of trust, existing institutions and traditions. Thus, countries like the Netherlands and Switzerland which did not experience harsh war destructions and extreme inflation phenomena have the tendency to establish Beverigdean plans by relying considerably on their savings (Garcia-Huitron and Ponds, 2015).

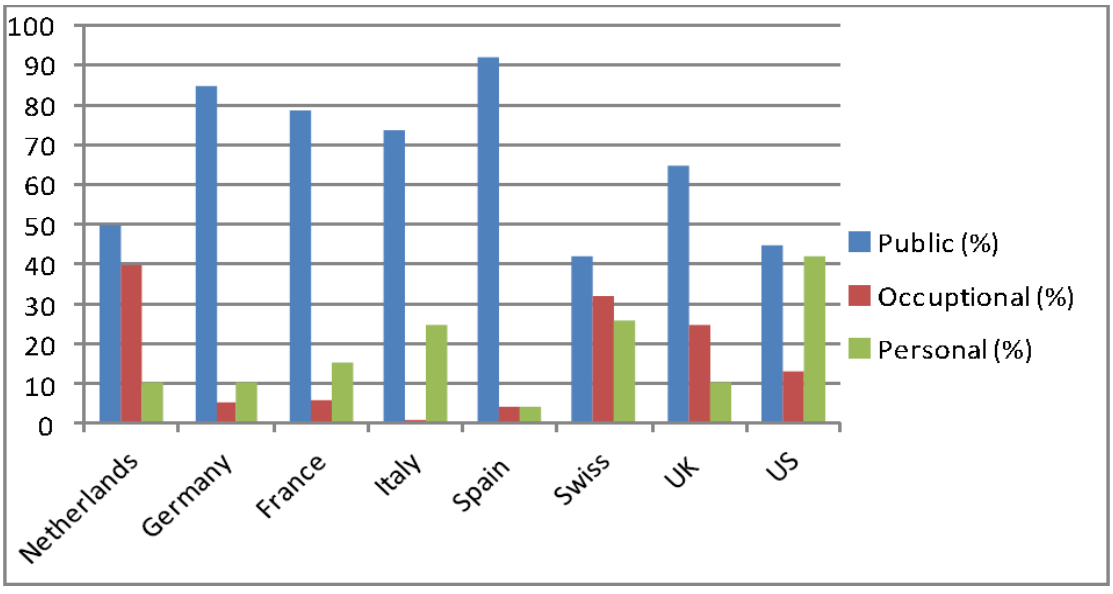
Furthermore, if workers aim to acquire additional pension benefits and secure a higher standard of living during their retirement, they have to accumulate more pension provision through the

[2]Aggregated information about all the pension funds that are supervised by DNB. The aggregate funding ratio can be derived by dividing liquid asset to estimated technical provisions.

second and the third pillar. Both of those schemes are funded. However, the second pillar is earnings-related and the participation is mostly mandatory because participation is defined through the "pension contract" between the employee and the employer. That is why these schemes cover about 90 percent of the labour force. (Bovenberg and Gradus, 2014). On the other hand, third pillar consists of voluntary personal pension plans and this is important particularly for self-employed individuals, who lack occupational pension provisions. The third pillar is relatively less developed than the other two pillars. The following figure is quite intuitive to highlight the different sizes of the pillars. Another interesting fact is that the value of assets currently equals to approximately 1,378 billion dollars (183.6% of GDP)[3].

After describing briefly the institutional and regulatory background of the Dutch pension system, we can proceed with the focused illustration of the advantages and disadvantages of second pillar schemes of the Netherlands, based on various aspects like architecture, risk sharing and adequacy In order to provide a more organized review in this essay, we will retain a structure very similar to the paper of Garcia-Huitron and Ponds (2015). Therefore, the structure of this essay is as follows. Section 3 examines the benefits and the concerns of during accumulation face in Dutch occupational pension system. Similarly, Section 4 reviews briefly the decumulation procedure and the available options. Section 5 examines the available behavioral structure of the corresponding second pillar's Dutch pension schemes. Section 6 concludes.

Figure 2: Sources of retirement income - the size of three pillars



Source: Bovenberg and Gradus, 2014

[3] Willis Tower Towers Watson, Global Pension Assets Study 2016

3. Advantages and Disadvantages of the Accumulation Phase4

The first profound aspect of the accumulation phase is the selection of pension provider. In the Dutch occupational pension system and generally in the context of Delegated Choice Model, the selection of pension provider on behalf of workers/ future retirees is done by the "social partners". In the same time, "social partners" determine contribution rates, indexation of pension rights and the investment mix of the accumulated through contributions. Therefore, the freedom of selection is constrained which leads to either minute or no competition at all because all the parameters have been predetermined uniformally from the "social partners" for all the pension fund's participants. However, choice delegation has both strong features and weaknesses.

Firstly, due to low competition levels, the pension funds have no need for marketing expenses which can be translated into low operative costs (Garcia-Huitron and Ponds, 2015). In other words, the pension funds become more cost efficient and as a result this is beneficial for the participants because they can provide lower contribution for the same pension right in comparison with the case when the competition between pension funds is high. Another benefit could be the fact that delegation is less costly because it does not require effort from the workers to search all the available options of the market. Accordingly, when financial markets are incomplete[5] and the participants suffer from financial illiteracy, which implies that they could not be in position to grasp the content of a pension contract, then the delegated decision will provide them higher welfare in the future comparing to the individual choice.

On the other hand, a uniformal choice for all individuals ignores the alternative preferences that individuals actually have. For instance, there are people that are more risk lovers than others. For them a less conservative investment mix is needed because through riskier choices they could possibly achieve higher retirement benefits in the future. In contrast to risk-averse participants, who are satisfied with very conservative investment mixes as long as the level of their future benefits is secured. Furthermore, it has assumed initially that "social partners" and subsequently, the selected pension funds serve their fiduciary duty. However, there is the case that their interests differ from the respective interest of their participants. Consequently, their decision could not be optimal and their intervention detrimental. Hence, it is profound that delegation entails principal-agent costs.

Moving forward, it is utterly important to investigate the risk sharing-smoothing abilities that the Dutch occupational pension system has and how it can hedge the macroeconomics risks. The paper of Bovenberg and Gradus enlightens about the problems that Dutch collective defined-contribution (CDC) schemes usually face. After their analysis, using multiple simulations within an ALM (Asset-Liability Management) context, they propose a change of occupational pension system towards to Collective Individual Defined Contribution (CIDC) and not to an Individual Defined Contribution (IDC) scheme.

Obviously, in general, the change from defined contribution (DB) to more collective schemes, as Ponds and Van Riel (2006) mention, improves the abilities for risk sharing because one part of the risk is shifted from employers towards employees. This risk diversification increases

[4] In our analysis both accumulation and decumulation phase are occurring under the assumption that the type of the Dutch occupational pension system is Collective and Defined Contribution (CDC). In addition, all the reforms that presented in the paper of Draper et al (2014) have been completed.
[5] Not able to provide efficient pension contracts and share the risk.

both social solidarity because in DB schemes only employers were responsible for the deficits of pension funds, and the capacities of pension scheme to distribute risks among generations. Additionally, the transition towards to more collective schemes is accompanied with *age-dependent indexation*[6] and *average-wage*[7] *schemes* from final-*pay schemes*. Those two changes diminish longevity and solvency risk respectively, and eventually lower the risk of underfunding.

Moreover, collective still suffers from: i) vague ownership of surplus, ii) back-loading of pension benefits and iii) no tailor-made risk management (Bovenberg and Gradus, 2014). The first weakness is generated from the fact that the risk is shifted also to employees. This is transition makes more difficult to identify the ultimate risk bearer and consequently, the owner of the surplus. Although, the ambiguity of ownership augment he intergenerational conflicts and complicate the evaluation of pension rights.

The second drawback is common to both occupational DB and CBC pension schemes. Pension rights are back-loaded due to uniform pension accrual rates and contribution rates, regardless of age. Workers accumulate most of their pension value at the end of their working career. That is why, in more general base, back-loading impedes the portability of pension rights if people change jobs frequently in the labour market. Thus, the back-loading pension rights are inappropriate for flexible transitional labour market and increases the discontinuity risk.

The advanced risk management within the context of the CIDC occupational schemes is able to overcome the third weakness that characterizes the CDC schemes. Through the individual accounts where the individual property/ pension rights can be calculated clearly and by knowing the risk profile of each individual, pension funds are in position to project better their future income streams and realize the pension obligations that they must pay. Hence, pension funds can hedge investment, inflation and interest-rate risk much more efficient. To sum up, the main advantages/ characteristics of the CIDC pension schemes hold over the other plans, are demonstrated at the following table.

Table 2: Different systems and some of their characteristics

	DB	*CDC*	*IDC*	*CIDC*
Accrual actuarially fair	No	No/Yes	Yes	Yes
Clear individual property rights	No	No	Yes	Yes
Tailor-made intergenerational risk management	No	No	Yes	Yes
Scope for individual choice	No	No	Yes	Yes
Mandatory saving	Yes	Yes	No	Yes
Collective procurement	Yes	Yes	No	Yes
Collective sharing biometric risks	Yes	Yes	No	Yes

Source: Bovenberg and Gradus (2014)

[6] Ponds, E. H. M., and B. van Riel (2006), "The recent evolution of pension funds in the Netherlands: The trend to hybrid DB-DC plans and beyond", pp. 21.
[7] Ponds, E. H. M., and B. van Riel (2006), "The recent evolution of pension funds in the Netherlands: The trend to hybrid DB-DC plans and beyond", pp. 1&8.

The last thing that should be discussed in the accumulation phase is the variety of liquidity options that the Dutch occupational pension system has. According to Garcia-Huitron and Ponds (2015), the Netherlands do not permit any type of withdrawals during the accumulation period. However, other countries that belong to the same role model allow withdrawals under specific conditions. For instance, Denmark allows withdrawals with an anti-incentive by taxing the 60 percent of the withdrawal amount while Switzerland permits those funds to be used to repay mortgages or to be used as collateral for housing loans.

The scarcity of liquidity options[8] is not beneficial for the pension funds' participants because those accumulated could be proved useful for other occasions. Therefore, in the case of the Netherlands it could be better to provide withdrawal options for housing (like Switzerland) and for health care reasons like the Centralized Choice Model of Singapore. Nonetheless, we can fathom why the Netherlands do not provide liquidity options before retirement, considering the decreasing funding ratios, especially when the liabilities surpass the assets. Thus, this could be proved beneficial and improve the stability of pension fund by lowering the liquidity risk.

Table 3: Special Purpose Withdrawals

	SPS	Taxed	All-purpose	Housing	Health	Other	Loan & repay	Permanent	Feeder
AU	Yes	Yes		X	X			X	
CHL	No								
DN	Yes	Yes	X					X	
NL	No								
SGP	Yes	No		X	X	X			X
SW	Yes	Yes		X			X		
UK	Yes	Yes							
USA	Yes	No		X	X	X	X		

Note: The above acronyms are used for the countries: Australia (AU), Chile (CHL), Denmark (DN), Netherlands (NL), Singapore (SGP), Switzerland (SW), United Kingdom (UK) and United States (USA).

Source: Garcia Huitron (2014)

4. Benefits and Drawbacks of the Decumulation Phase

Interestingly, Netherlands is the only country among the four case studies which belong to Delegated Choice Model (Sweden, Switzerland and Denmark) where is mandatory for the workers to buy full annuities for their retirement. This legislation extends to all the pillars of the Dutch pension system. Partial lump-sums are not allowed although there is some flexibility through the so-called high-low options under the annuity framework, after the reforms (Manuel Garcia Huitron, 2014).

The compulsory annuity rule is quite beneficial for the participants because annuities offer protection against longevity risk by guaranteeing a stream of payments from purchase until death. In addition, if the pension funds are sophisticated and the financial markets complete then the wealth of those who have died can be distributed among the other retirees. This recourse sharing lessens considerably the idiosyncratic risk of mortality. Noticeably, a few countries impose taxes on the lump-sums as an anti-incentive in order to motivate individuals

[8] Illustated with details at Table 3

to select annuities as their future income stream, like the following table presents. Unfortunately, the data for the Netherlands are missing.

Table 4: Tax approach to partial lump-sums

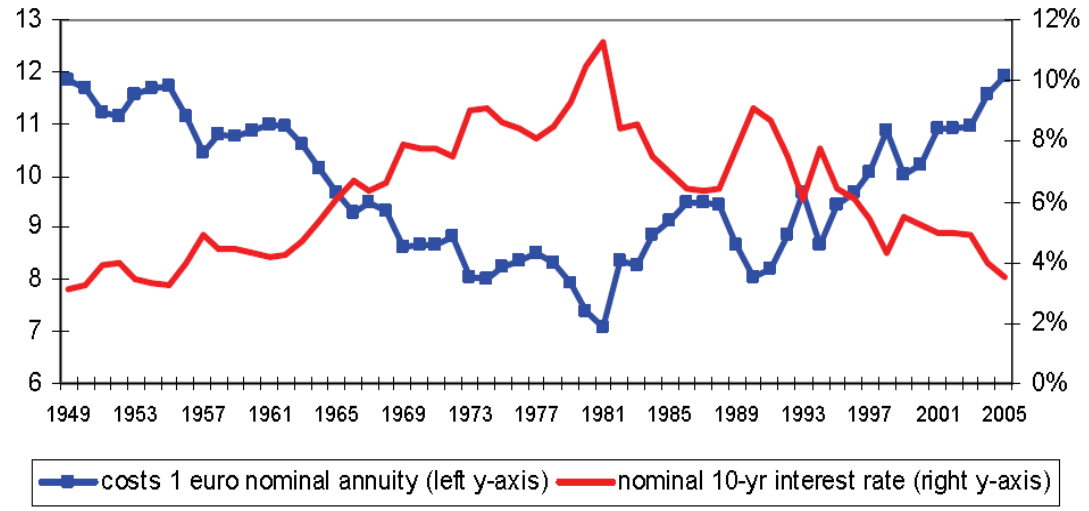
	Taxation approach	Tax on partial lump-sums?	Tax rate
AU	ttt	Yes	MITR rate if coming from untaxed source
CHL	EET	Capped	Tax free up to a limit
DN	ETT	Yes	Flat rate 40 percent
NL	EET	n.a.	n.a.
SGP	EEE	Tax free	n.a.
SW	EET	Yes	MITR that varies by canton
UK	EET	Yes	MITR
USA	EET / TEE	Yes / Tax free	MITR if coming from tax deferred source

Note: "MITR" stands for marginal income tax rate; "n.a." means not applicable. The above acronyms are used for the countries: Australia (AU), Chile (CHL), Denmark (DN), Netherlands (NL), Singapore (SGP), Switzerland (SW), United Kingdom (UK) and United States (USA).
Source: Garcia Huitron (2014)

On the other hand, lump-sums could beneficial because they provide more available options for the retirees with respect to their time preferences. Apparently, people have different preferences towards to income streams and their needs e.g. health care, housing, pay debts. However, lump-sums entail significant risk. Indeed, people are prone to spend all their pension provisions imprudently and they could end up with no money. Therefore, especially full lump-sums cannot protect retirees from longevity risk.

Unfortunately, sometimes the annuitization is quite complex and workers tend to choose options which contain lump-sums. Another interesting fact that should be mentioned, is that even if the annuities hold a few considerable merits and benefits for the retirees, their cost have increased during the last years due to the low nominal interest rates. The following figure helps us to comprehend the correlation between the cost of buying one euro of annuity and the nominal interest rates. The available data are until 2005, but nonetheless it is apparent to ponder that nowadays the interest rate within EU are very low which can be translated to even higher cost of purchasing annuities.

Figure 3: Conversion risk nominal annuity in the Netherlands (1949-2005)



Source: Pond and van Riel (2006)

Finally, for the section of decumulation phase the high-low options of the Dutch pension system should be described. Manuel Garcia Huitron (2014) explains transparently, in his analysis, the two available options of *high-low income streams*. Very briefly, high-low contracts are annuities with flexibility regarding the timing of payments around the retirement age. Therefore, they do not constitute partial lump-sums.

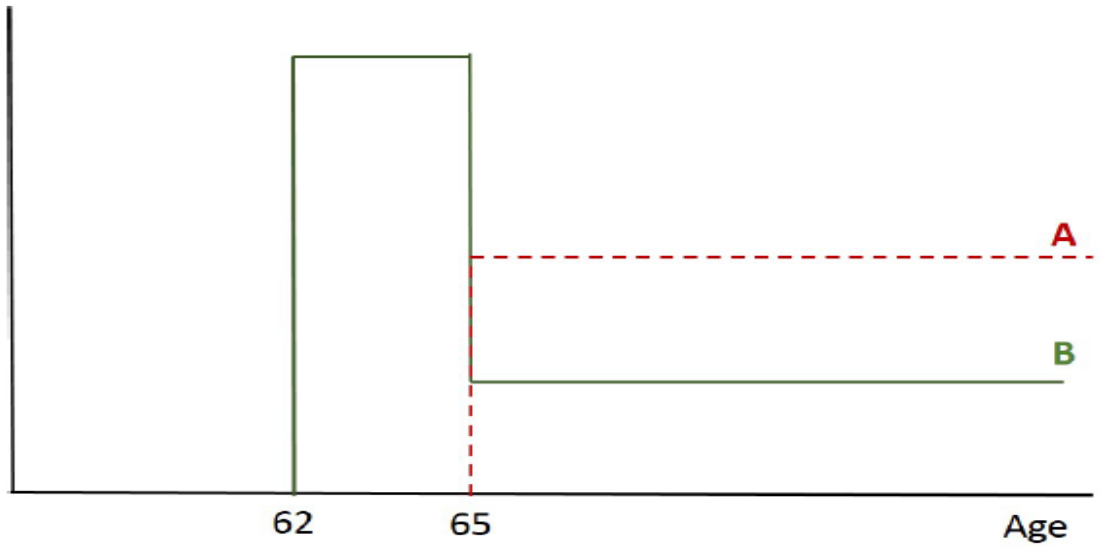
The two options under the high-low income streams are illustrated below:

i. Second pillar pension wealth can be used to generate an income stream at the level of AOW[9] income before statutory age. In Figure 4, A represents the normal pension benefit at age 65 while B is the benefit shape over time when bridging AOW income at age 62. This option is not available for low income workers because is like a full lump-sum for them.

ii. Future second pillar annuity pension payments can be brought to the present to get a higher payment for the first five or ten years and a reduced pension thereafter. The low payment amount must not be less than 75 percent of the high payment amount. In Figure 5, A represents the normal pension benefit at age 65 while C is the benefit shape when opting for a high-low income stream.

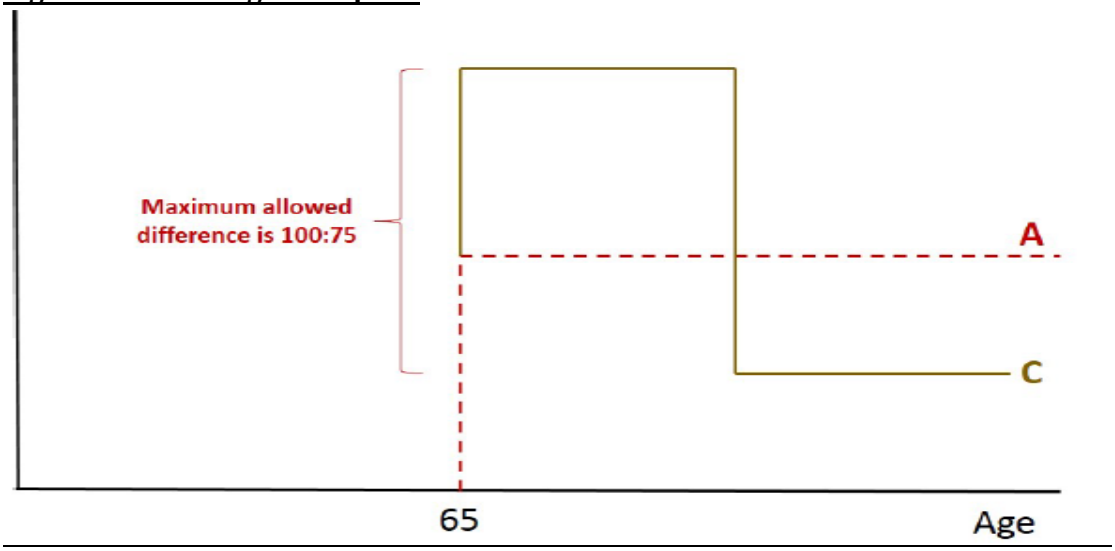
[9] The AOW is a basic state pension for people who have reached their AOW pension age.

Figure 4: First high-low option



Source: Garcia Huitron (2014)

Figure 5: Second high-low option



Source: Garcia Huitron (2014)

5. Behavioral Architecture/ Design

Garcia-Huitron and Ponds (2015) mention in their research that the case of the Netherlands is the only country from the delegated choice role model, in which there are not salient behavioral features in her pension system. The specific conclusion has a fundamental meaning because the behavioral science and extensively, behavioral economics through the corresponding literature has proved that behavior constitutes a major variable that has to be included in the economic analysis. Due to the fact that, people's behavior is actually not so rational and suffers from

various biases. Apparently, individuals' behavior is keep changing and this can be observed by the fact that the social preferences and preferences towards risk, and time are not consistent.

Furthermore, Bodie and Prast (2011) in their paper "Rational Pensions for Irrational People: Behavioral Science Lessons for the Netherlands" have taken into account the fundamental role of the behavioral insights and they argue that people's behavioral inconsistency must not be ignored in order countries (not only the Netherlands) to develop a sustainable and more robust pension scheme.

The authors after examining diligently empirical evidence from various countries and their implications, they propose specific reforms that should be implemented to the institutional architecture of the Dutch occupational pension system. The reforms are related with the introduction of "defaults" at both accumulation and decumulation phase. By the term "default", they mean that the pension system should determine the pension profile when participants are inactive.

In the accumulation phase, the participation should be compulsory and not quasi-mandatory. The mandatory participation will raise the savings and will motivate workers to realize the significant role of saving in order to maintain a standard of living during retirement. The substantial savings will contribute to the sustainably of Dutch pension system. Moreover, during the decumulation phase "defaults" will assign a standard mix between annuity and lump-sum in order to ensure the income flows during retirement period. This could be proved quite beneficial when the structure of annuities is obscure.

6. Conclusion

To sum up, after a brief review of the relevant literature for the Dutch occupational pension system, it is apparent that the architecture of the second pillar holds a few noticeable merits but there is also space for improving when the weaknesses of the corresponding scheme are detected and analyzed in depth. At last, behavioral tools and insights should be used extensively in order to augment the robustness of the second pillar.

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