

The Reforms of the General Pension Scheme: Evidence From the Tunisian Health Insurance Fund

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ABSTRACT

This paper describes the recent Tunisian reform and available options on major issues within this reform framework. A country's economic growth and political stability are two very important factors in the smooth running of an economy. Tunisia stands crippled by a climate of economic uncertainty. This has led the economy to suffer very serious collateral damage. Supply and demand seem to be affected, weakening all macroeconomic balances. The National Pension and Social Security Fund known as the CNRPS is in a critical situation and raises many fundamental and complex questions, which have been the subject of an ongoing hot debate. The objective of this study was to analyse and describe the reform of the general pension scheme and health insurance fund in Tunisia. The reform of the general pension scheme and health insurance fund is among the first in Africa countries. In order to find the best possible evidence, this was a review of online grey literature on regulatory approaches to reform the national pension and Social Security Fund known as the CNRPS and propose solutions related to the general pension system. The whole working career is the basis for the pension and the benefit drawn at a given age. Tunisian health insurance as CNRPS organization should robust retirement income system that delivers good benefits.

KEY WORDS: HEALTH INSURANCE, GENERAL PENSION, REFORM, CONTRIBUTION RATE, RETIREMENT, REVISION of PENSION.

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INTRODUCTION

Investigating the satisfaction of social security beneficiary and their expectations is of particular importance the rapid economic growth of a country plays a very important role in its national and international development. Some several researches have more or less explicitly – 2004 pointed to other aspects of recent pension restructuring. Privatization (Hinrichs, 2004), the segmentation between contributory and non-contributory benefits (Palier, 2002) and policies addressing new social risks (Bonoli, 2003, 2004) can be mentioned as selective examples. All persons who work in corporate enterprises, including company directors, are considered to be employees (OECD, 2018;2019).

However, Tunisia’s economic situation has changed and has thus affected the CNRPS pension fund. Since then, this latter has been facing a threat that still remains serious with regard to the imbalance in the general pension system (Department of Public Expenditure and Reform, 2019). Knowing that the main source of funding for the fund’s plan is the pay-as-you-go scheme, which is originally the concatenation of the two words: contribution (by the employee with a rate of 8.2%) and contribution (by the employer with a rate of 12.5%). It is therefore the time to

ask the following question: What pension plans does the CNRPS have? What are the causes of the budget deficit of this system? What are their consequences on the cash register? And what must be done to face this deficit in order to help the fund survive?

The Fund's Plans: The CNRPS operates social security schemes for public officials, local authorities, public administrative institutions, and national companies. These are essentially four pension plans to mention: The death benefit plan: This plan is financed through contributions deduced from the salaries of the active insured and retired employees and investments generated by the growth of the plan’s reserves. The subsidized scheme: The pensions provided by the latter are financed entirely from the State budget. The general regime: General pension plans are plans whose beneficiaries are employees of large public institutions. In Tunisia, the legal retirement age is still 60 years, but it is expected to be extended to 62 years very soon. The special regime: Special pension schemes are pension schemes from which members of a governorate benefit. Some different pension schemes keep the unequal conditions without any coordination. (As Pension Reform in France). The fund reserves: Reserves are built up from plan surpluses and depend on the length of time and investment rate

Table A.1: Receipts amounts evolution and their growth rate

YEAR	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Receipts	817	881	959	1089	1231	1404	1542	1770	2033	2250	2399
Amount	780	571	416	037	439	820	992	134	110	216	583
Growth rate in (%)		7,80	8,83	13,51	13,08	14,08	9,84	14,72	14,86	10,68	6,64

Chart A.1: Receipts growth rate evolution



and the size of the gap between the contribution rate required to maintain equilibrium and the current contribution rate. These reserves can be used to cover the annual deficits of a scheme in times of economic difficulties and can be a source of funding for the social security system through the income they generate when they bear fruit. The fund system: Since Tunisia's independence in 1956, social security systems have diversified and social security coverage has continued to expand to cover the largest number of the employed population. In this regard, it is possible to consider two models of pension systems: pay-as-you-go or funded. The pay-as-you-go system: In a pay-as-you-go pension system, the financing of pensions is ensured by compulsory deductions from the working population. These deductions are then redistributed to pensioners in the form of a pension. Working people do not contribute for themselves when they retire,

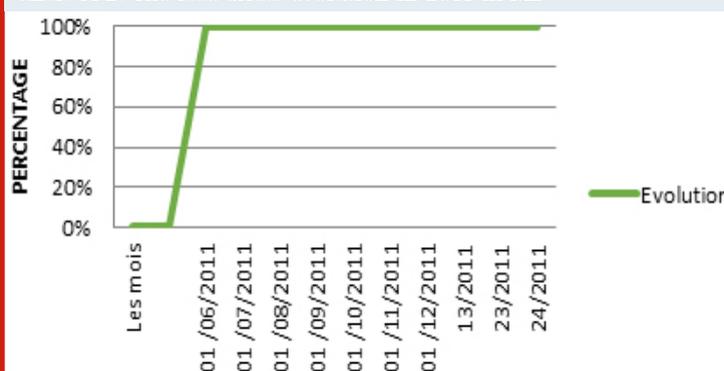
but for today's retirees. Their retirement will be ensured by the working people of tomorrow. The funded system: Unlike the pay-as-you-go system, the funded system bears on the fact that active population institute savings, individual or collective, that are invested on the financial markets. When they reach retirement age, they draw on it to finance their retirement. Pensions are therefore funded by previous savings, not by a redistribution of contributions to retirees. Retirement, whether funded or distributed, is ensured by the income from working people, and of course for everyone.

Retirement pillars: To fully understand the role of the pension system in financing pensions, it is necessary to go through the pillars of the notion of retirement. These are four: The term "pillars" is a common vocabulary in pension financing. The pillars represent the different sources of income

Table A.2: Increase in pension subsidy rate effect in the second half of 2011

MONTH	SUB RET	SUB PS	SUB PS E3 ESTIMED	SUB PS CALCULED	RATE	Evolution
01/06/2011	68956157,468	22548968,204	1477032,769	24026000,973	11,4802555	
01/07/2011	73607660 ,591	22057042,750	1563498,305	23620541,055	12,46502532	5905135,264
01/08/2011	75918724,374	22793818,647	1553373,857	24347192,504	12,47268643	6086798,126
01/09/2011	85307466,920	25737749,772	1599766,934	27337516,706	12,48210916	6834379,176
01/10/2011	81167863,229	24206593,325	1832786,551	26039379,876	12,46847868	6509844,969
01/11/2011	81103025,872	24256616,594	1750136,529	26006753,123	12,47414862	6501688,281
01/12/2011	82210542,663	24608047,676	1728380,666	26336428,342	12,48620984	6584107,086
13/2011	12608407,583	4052569,931	0,000	4052569,931	12,44485134	1013142,483
23/2011	9387177,420	2853759,138	171142,355	3024901,493	12,41320082	576255,373
24/2011	15276000,971	4665906,875	247910,312	4913817,187	12,43513984	1228454,297
TOTAL	41419775,054					

Chart A.2: The rate effect evolution in 2011 in MD



available to pensioners. We distinguish four pillars: Minimum seniority, past contributions-based pensions, individual savings, and work revenues.

Deficit Causes and their Consequences on The Fund the Main Causes Fall into Three Categories:

Cyclical causes, which combine circumstances because of the country’s economic situation. Indeed, on the one hand, unemployment and poverty are increasing, then the fund has fewer contributions at its disposal. On the other hand, wages also stagnate and so do social contributions deduced from wages and so do contribution revenues, which lead to slower growth and subsequently to a widening deficit. Exogenous structural causes which represent a set of causes caused by external factors related to the CNRPS system. These can be the increase in health expenditure and the deficit of the sickness branch as well as the old age branch which also generate an increase in the deficit of the system in question. Endogenous structural causes, which are a set of causes formed within the fund system without

external factors. They manifest themselves in the social contributions levied on salaries resulting in a decrease in revenues, the reimbursement of health care (see free care) and compensation for sick leave, leading to abuse. These in turn imply increased expenses, implying thus that all the causes presented above have generated a huge deficit in the general balance of the fund.

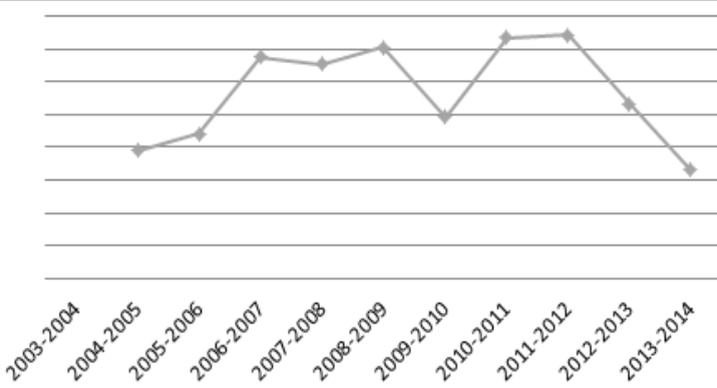
RESULTS AND DISCUSSION

Bearing on the detailed analysis of the deficit of the general pension system, we discuss two main components: revenues and expenditure. We present first the analysis of the evolution of revenues in response to the effect of the growth rate and the effect of the contribution rates. Second, we present the evolution of expenditure in terms of pensions and in terms of the evolution of the demographic component, which is very important. Deficit analysis by revenue: The evolution of the deficit in response to the effect of revenue growth rate: In Table 2.1, the amount of annual revenue has increased. It went from

Table A.3: The evolution of the effect of the overall rate and the effect of the employer rate

YEAR	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Rate effect two years by two (%)		7,80	8,83	13,51	13,08	14,08	9,84	14,72	14,86	10,68	6,64
Overall rate effect by four years (%)		13,20		-3,22		-30,14		0,92		-37,84	

Chart A.3: The evolution of the effect of the overall rate and the effect of the employer rate



817780 MD in 2004 to 2399583 MD in 2014. In the graph, revenue growth rate fluctuates from year to year. It is 7.80% in 2005, 14.72% in 2011 and 6.64% in 2014. Table A.2 shows the increase in pension subsidy rate by 1% during the second half of 2011: NB: the increase in the effect of the employer pension subsidy rate increased by 1% compared to the 2nd half of 2011, otherwise employer rate became 12.50% instead of 11.50% for the general scheme. Therefore, bearing on Table A.2, a 1% increase in this rate has a positive and significant effect on the fund's revenues, which is reported in the figure below. In the figure below, we can see that each time the rate changes, whether for the general or special regime, the revenues change gradually. Moreover, the positive effect of an increase in the rate only appears after two years and does not persist because of many demographic factors beyond the control of the fund. These factors are ageing of the population and change in life expectancy of pensioners. Summary Table A.3 and Chart A.3, below, represents the evolution of

the overall effect and the effect of the employer rate: In Table A.3 and Figure A.3 above, it can be seen that with each change in the rate, whether for the general or special regime, revenues change gradually and the positive effect of an increase in rates only appears after two years and does not persist because of many demographic factors beyond the control of the fund. These factors are ageing of the population and changes in pensioners' life expectancy. The evolution of the deficit by contribution rates: At this level, a distinction should be made between two terms commonly understood by economists, namely contributions deduced from the employee's salary, which is set at 8.20%, and the contribution paid by the employer to CNRPS, which is currently set at 12.5%. So, The income related pension financed by contributions. (here is like The new system for public pensions in Sweden). According to the above table, taken from the CNRPS's control management department, we notice that from July 2011 to 2015, contribution rates for the two agents (employee and employer) are static

Table A.4: Year by year contribution rates evolution

Retirement Effective Date	Foresight social		Death benefit Affiliated	Observations		
	Affiliated contribution	Employer contribution			Affiliated	Employer
	General scheme		-	-	-	
01/10/1985	5%	7%	1%	1%	1%	
01/07/1995	6%	8,20%	1%	1%	1%	
01/07/2002	6,50%	8,70%	1%	1%	1%	
01/07/2003	6,75%	8,95%	1%	1%	1%	
01/07/2004	7%	9,20%	1%	1%	1%	
01/07/2005	7%	9,45%	1%	1%	1%	
01/07/2006	7%	9,70%	1%	1%	1%	
01/01/2007	7,40%	10 ,30%	1%	2%	1%	
01/01/2008	7 ,80%	10,90%	1,88% (1)	2%	1%	(1)2% for pensioners
01/01/2009	8,20%	11 ,50%	1,88%	3%	1%	
01/01/2010	8,20%	12 ,50%	2,75% (2)	3%	1%	(2)3% for pensioners
01/01/2011	8,20%	12 ,50%	2,75% (3)	4%	1%	(3)4% for pensioners
01/01/2012	8,20%	12 ,50%	2,75%	4%	1%	
01/01/2013	8,20%	12 ,50%	2,75%	4%	1%	
01/01/2014	8,20%	12 ,50%	2,75%	4%	1%	
01/01/2015	8,20%	12 ,50%	2,75%	4%	1%	

Table B.1: Evolution of expenditure amounts and their growth rate

YEAR	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Expenditure	799	894	1004	1132	1273	1428	1627	1874	2153	2446	2679
Amounts	915	465	635	642	007	108	377	768	997	025	490
Growth rate in (%)		11,82	12,32	12,74	12,39	12,18	13,95	15,20	14,89	13,56	9,54

Chart B.1: Evolution of Expense Growth Rates

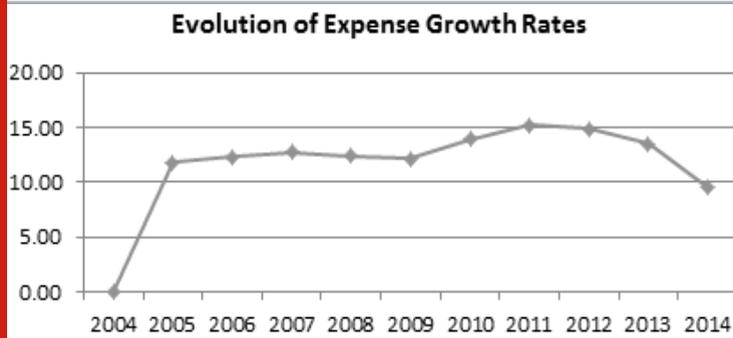
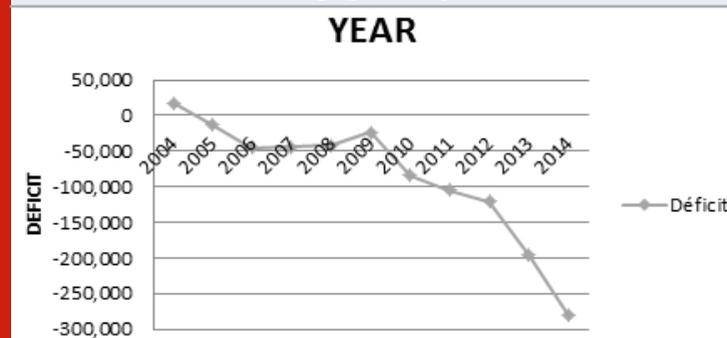


Table B.2: Evolution of receipts and expenditure amounts

YEAR	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Receipts	817	881	959	1089	1231	1404	1542	1770	2033	2250	2399
Amount	780	571	416	037	439	820	992	134	110	216	583
Expenses	799	894	1004	1132	1273	1428	1627	1874	2153	2446	2679
Amount	915	465	635	642	007	108	377	768	997	025	490
Deficit (MD)	17865	-12894	-45219	-43605	-41568	-23288	-84385	-	-	-	-
								104634	20887	195809	279907

Chart B.2: Deficit evolution graphical representation



otherwise they have not moved.

Deficit analysis by expenditure: The evolution of the deficit in terms of pensions: In Table B.1, expenditure amounts have increased annually. It went from 799915 MD in 2004 to 2679490 MD in 2014. Graph B.1 shows that the expense growth rate fluctuates from one year to the next. It is 11.82% in 2005, 15.20% in 2011 and 9.54% in 2014.

The real evolution of the deficit: Table B.2 includes fluctuations in the fund's annual receipts and expenditure: In Table B.2 and Graph B.2, the deficit has increased annually from 12,894MD in 2005 to 279,907MD in 2014. The evolution of the deficit by the demographic factor: The demographic component has a very important role in analyzing expenditure effect on the fund's deficit. In fact, the demographic component represents the mortality table; also known as the life table. This latter is defined as "a construct that makes it possible to follow the fate of a population in detail". This tool is mainly used in demography and actuarial science to study the number of deaths, probabilities of death or survival and life expectancy by age and gender. There are two types of mortality tables: the current mortality table and the generation mortality table where the question arises: what is the difference between the two tables? The current mortality table is constructed on a fictitious generation of 100,000

individuals, then on monitoring the evolution of such a population under the effect of a single elimination factor, namely the mortality factor. We can conclude that in the case of CNRPS, since it is still in deficit (the difference between income and expenditure is negative), it manages this deficit to some extent, either through the monthly reserve of 40 to 50 billion Tunisian dinars that it has at its disposal in the event of late payment by public institutions, or through a delay in payment to the CNAM, or through a loan from the Ministry of Finance. Hence, the present question: Is it possible to mend this deficit? Proposed solutions for the reform of the general pension system: The whole working career is the basis for the pension and the benefit drawn at a given age(Karl Gustaf Scherman : Honorary President of the International Social Security Association; former Director of the National Social Insurance Board in Sweden said it about the Sweden system reform).

In order to control the balance of the general pension system in the long term, a number of solutions should be envisioned to adjust any possible imbalances. This can be done by acting on the factors reducing the revenues of this system, such as, for example, the retirement age limit, the contribution rates, as well as acting on the factors increasing expenditure, like revising the pension calculation parameters. In this regard, we will present solutions that consider

Table C.1.1: The evolution of receipts amounts (2004 - 2010) and growth rate in% after a 1% increase in employer and employee contribution rates

YEAR	Receipts Amount (MD)	Evolution of the growth rate in (%)
2004	817 780	
2005	881 571	7,80
2010	1 542 992	9,84
2014	2 399 583	6,64
2015	2 792 210	16,36
2020	4 705 037	11,00
2025	7 928 261	11,00
2030	13 359 581	11,00
2035	22 511 670	11,00
2040	37 933 474	11,00
2045	63 920 109	11,00
2050	107 709 101	11,00

Table C.1.1: The evolution of receipts amounts (2004 - 2010) and growth rate in% after a 1% increase in employer and employee contribution rates

YEAR	Receipts Amount (MD)	Evolution of the growth rate in (%)
2004	817 780	
2005	881 571	7,80
2010	1 542 992	9,84
2014	2399583	6,64
2015	2 920 884	21,72
2020	4 921 859	11,00
2025	8 293 619	11,00
2030	13 975 230	11,00
2035	23 549 074	11,00
2040	39 681 560	11,00
2045	66 865 736	11,00
2050	112 672 654	11,00

Table C.2.1: The evolution of the impact of the demographic ratio in%

YEAR	Impact on the demographic report
2011	1,00
2012	1,01
2013	1,01
2014	0,89
2015	0,96
2020	0,96
2025	0,96
2030	0,96
2035	0,96
2040	0,95
2045	0,95
2050	0,95

the revenues and expenditure, with 2009 as the base year for any forecast.

Revenue-based solutions: Solution 1: a 1% increase in the employer and employee contribution rates (i.e. instead of 20.70% we have 21.70%): After projections made, we notice that after increasing the contribution rate by 1%, a revenue of 2,792,210 MD will be achieved in 2015 compared to 2,399,583 MD in 2014. Thus, we earned 392,727 MD in one year. Solution 2: a 2% increase in the employer and employee contribution rates, i.e. instead of 20.70%, we have 22.70%: Similarly after the projections made, we notice that after increasing the contribution rate by 2%, we achieve a revenue of 2,920,884 MD in 2015 against 2,399,583 MD in 2014. As a result, we gain 521,301 MD in one year. Expenditure-based solutions: Solution 1: The legal retirement age is set to 62 instead of 60: Similar to our analysis of the revenue-based solutions, extending the

Table C.2.2: The evolution of expenditure amounts and their average, annual equalization amounts and their average, retirement amounts and their average, the effect of equalization (in MD) and their annual and average growth rates in%

YEAR	2008	2009	2010	2011	2012	2013	2014
Expenses Amount in MD	1 273 007	1 428 108	1 627 377	1 874 768	2 153 997	2 446 025	2 679 490
Average expenses in MD	1 926 110						
Growth rate of expenditure amounts in (%)		12,18	13,95	15,20	14,89	13,56	9,54
Average growth rate of expenditure amount in (%)	13,22						
Equalization effect in MD	44 573	119 823	112 377	145 556	164 334	117 170	44 432
Average equalization effect in MD	1 06 895						
Equalization effect growth rate in%		6,50	15,80	14,14	15,06	17,05	13,15
Average Equalization Effect Growth Rate in%	13,62						
Evolution of the equalization effect in (%)	5,55						
Evolution pensions without equalization effect in MD	1 228 434	1 308 285	1 515 000	1 729 212	1 989 663	2 328 855	2 635 058

retirement age, we notice that until the year 2050, there are 0.96 working people, i.e. only one active person to pay a pension for a single pensioner as projected in Table C.2.1. below: Looking into the table of changes in expenditure amounts and their average, the annual equalization amounts and their average, the retirement amounts and their average and the effect of equalization amounts and their annual and average growth rates (%), we notice that the growth rate of the retirement amounts effect in (%) has increased annually. It rose from 6.50% in 2009 to 13.15% in 2014. To examine the evolution of expenditure during

2015 and 2016, a rate of 5.55% was set for the evolution of the equalization effect, which is an average rate, and then an average growth rate of the retirement amounts effect was set at 13.62% to make projections until 2050. Accordingly, the table below shows that expenditure (in MD) evolved from 2015 to 2050. We notice that for the two years 2015 and 2016 and by increasing the rate of the equalization effect, expenditure amount increased by 147,372 MD in 2015, by 302,849 MD in the following year compared to 2014 and 155,477 MD in 2015 compared to 2016. Therefore, spending has increased annually. Indeed, expense amounts went from 2 679 490 MD in 2014 to 229 097 182 MD in 2050.

YEAR	Solution : Retirement limit age is 62 years Expenses Amount in MD
2014	2 679 490
2015	2 826 862
2016	2 982 339
2020	4 970 227
2025	9 411 311
2030	17 820 671
2035	33 744 110
2040	63 895 739
2045	120 988 982
2050	229 097 182

Like in the French pension system and 2003 reform (Francois Jeger and Michele Lelievre) for getting more flexibility they with introduce the deductions and bonuses according to duration of contribution with actuarial neutrality. Anyone older than 60 years can retire, with a deduction of 5% per year for fewer than 40 years of contributions and with a bonus of 3% per year for greater than 40 years of contributions.

Solution 2: Revision of pension calculation: The main aim of revising pension calculation is to re-amend or re-improve it to reduce pension expenditure. Referring to our projections and the table below describing the evolution of expenditure for pensioners (with a replacement rate of 80%) with an average growth rate set at 13.62%, we notice that from 2015 onwards, expenditure amount is increasing.

YEAR	Solution : Return rate 80% instead of 90% Expenses Amount in MD
2014	2 673 780
2015	3 037 949
2016	3 451 717
2020	5 752 470
2025	10 892 518
2030	20 625 393
2035	39 054 956
2040	73 952 026
2045	140 030 940
2050	265 153 844

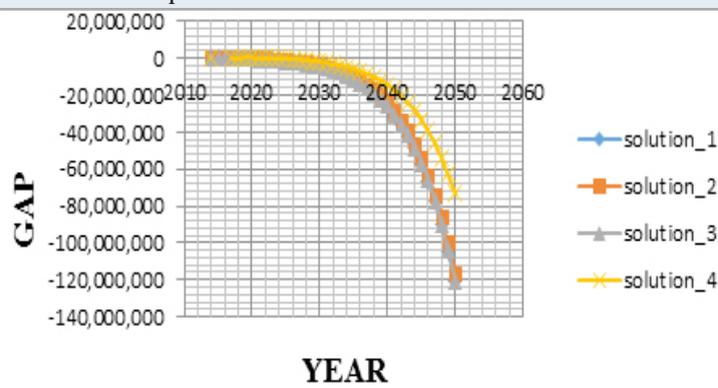
Combined solutions: Below is a summary table that presents the projections of the combined solutions:

- Solution 1: H 3 : 62 years old + an increase in contribution rate 1% (Receipts) + H 1 : The retirement age limit is 62 years old (Expense) In our summary table, for the two years (2016 and 2017), CNRPS will achieve a surplus of 177,890 MD, which will allow it to cover two more years for an amount of 155,750 MD.
- Solution 2: H 4 : 62 years old + an increase in contribution rate 2% (Receipts) + H 1 : The retirement age limit is 62 years old (Expense) In our summary table, for the five years (from 2015 to 2019), CNRPS will achieve a surplus of 793 856 MD, which will allow it to cover another three additional years for an amount of 561 413 MD.

Table C.2.5: Summary table of proposed solutions

YEAR	Solution 1: H 3: Age 62 + raise rate cot 1% (Recipe) + H 1: Retirement limit age is 62 (Expense)	Solution 2: H 4: Age 62 + raise rate cot 2% (Recipe) + H 1: Retirement limit age is 62 (Expense)	Solution 3: H 3: Age 62 + raise rate cot 1% (Recipe) + H 2 : Pension calculation revision + limit age 62 years (Expense)	Solution 4: H 4: Age 62 + raise rate cot 2% (Recipe) + H 2: Pension calculation revision +limit age 62 years (Expense)
2014	-279 907	-279 907	-274 197	-274 197
2015	-30 755	98 098	-24 731	104 122
2016	121 340	264 367	127 695	270 722
2017	56 550	215 310	63 771	222 531
2018	-26 009	150 214	-17 805	158 418
2019	-129 741	65 867	-120 420	75 188
2020	-258 623	-41 499	-248 031	-30 907
2025	-1 471 985	-1 106 117	-1 451 929	-1 086 061
2030	-4 442 445	-3 825 937	-4 404 469	-3 787 961
2035	-11 201 021	-10 162 169	-11 129 112	-10 090 260
2040	-25 909 323	-24 158 797	-25 773 161	-24 022 635
2045	-56 979 662	-54 029 924	-56 721 834	-53 772 096
2050	-121 237 756	-116 267 275	-120 749 550	-115 779 069

Chart C.2.5: Representation of the simulated solutions



- Solution 3: H 3 : 62 years old + an increase in contribution rate 1% (Receipts) + H 2 : Revision of pension calculation + age limit 62 years old (Expense). In our summary table, we forecast that for the two years (2016 and 2017), CNRPS will achieve a surplus of 191 466 MD and which will allow it to cover another 2 years for an amount of 138 225 MD.
- Solution 4: H 4 : 62 years old + an increase in contribution rate 2% (Receipts) + H 2 : Revision of pension calculation + age limit 62 years old (Expense). In our summary table C.2.5, we observe that for the five years

(from 2015 to 2019), CNRPS will achieve a surplus of 830,982,100MD and which will allow it to cover another 3 years for an amount of 525,113 MD. Then, it seems that solution four is the best solution because its obtained projected figures are much higher than those of the other proposed solutions (solution four's figures(830 9821 MD) are greater than those of solution one (= 177 890 MD), those of solution two (793 856 MD) and those of solution three (= 191 466 MD)). The graph also shows that solution four (yellow line) is the best as a reform solution for the general pension system. It allows CNRPS to cover

more years in terms of deficit. We notice that from 2015 to 2019, the curve has shrunk.

CONCLUSION

As a conclusion, in this paper and thorough analysis, we presented the current situation of the CNRPS and simulated some relevant proposals to mend for the deficit of the general pension system, which has been a serious problem for years and years. This study proposes some solutions to satisfy the expectation and intention of members that impact positively their loyalty. So the CNRPS should have a first class and robust retirement income system that delivers good benefits, is sustainable and has a high level of integrity. (Denmark country system have a grade A with index value >80).

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