


FUNDING DEFICIT PENSION SYSTEM: STRUCTURAL REFORMS THAT NECESSARILY INVOLVE PARTIAL PRIVATIZATION OF PENSIONS IN ALGERIA

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ARTICLE INFO	ABSTRACT
<p>Article history:</p> <p>Received 31 June 2023</p> <p>Accepted 27 September 2023</p>	<p>Purpose: The objective of this work is to highlight the various reform measures to be undertaken in order to ensure the sustainability of general pension schemes, in particular those aimed at promoting the partial capitalization of pensions in Algeria.</p> <p>Theoretical framework: Like most countries in the world, the Algerian pension system, which is managed on a PAYG basis, is currently facing major funding problems. Indeed, despite the measures taken to reduce its financial deficit, the latter has persisted since 2013 and has been estimated at almost 2.7 billion USD at the end of 2022. In fact, if measures to lay the foundations for sustained growth, which creates jobs (with improved inclusion in social security), are taken by the government, the system could regain its balance in the short and medium term. However, the problem of population ageing, which could occur in a few decades, reminds the urgent need for structural reforms.</p> <p>Design/Methodology/Approach: The design of the study is descriptive and analytical. Data for this study were collected from official Algerian sources, namely the NRF and the NOS, while content analysis was conducted by interpreting these data.</p> <p>Findings: The results of this study show that the Algerian public authorities have taken many measures in recent years to fill the deficit in the pension system, of which the repeal at the end of 2016 of the early and unconditional age pensions with possibility of maintaining the activity until the age of 65, the establishment of the NPRF in 2006, the introduction of additional revenue from customs duties applied to goods import operations from 2020, and the introduction of the NSSF in 2021. Nevertheless, this would in no way escape the insolvency of the pension scheme, hence the need for a structural reform that targets in addition to parametric changes, the introduction of a capitalization dose complementing the current pension system (supplementary pension) for its rebalancing in the short, medium and long term.</p> <p>Conclusion: the availability of substantial oil revenues may downplay the importance of the financial problems facing the Algerian pension system and their impact on budget stability (according to the NRF, the fund's deficit stood at 376 billion DZD in 2022 and could reach 1.200 billion DZD in 2030), whereas this oil boom should be used to finance the transition by adopting a partially funded pension scheme. At the same time, this would require more efforts to boost the stock market in order to create an environment conducive to the establishment and development of this funded pillar.</p> <p>Doi: https://doi.org/10.26668/businessreview/2023.v8i10.3878</p>
<p>Keywords:</p> <p>Algerian Pension System; Bismarckian System; Funded Pension; Pareto Optimum.</p> <div data-bbox="172 949 480 1196" style="text-align: center;">  </div>	

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SISTEMA DE PENSÕES DE DÉFICIT DE FINANCIAMENTO: REFORMAS ESTRUTURAIS QUE ENVOLVEM NECESSARIAMENTE A PRIVATIZAÇÃO PARCIAL DE PENSÕES NA ARGÉLIA

RESUMO

Objectivo: O objectivo deste trabalho é destacar as diversas medidas de reforma a emprender para garantir a sustentabilidade dos regimes gerais de pensões, em particular aquelas que visam promover a capitalização parcial das pensões na Argélia.

Enquadramento teórico: Tal como a maioria dos países do mundo, o sistema de pensões argelino, que é gerido numa base de repartição, enfrenta actualmente grandes problemas de financiamento. Com efeito, apesar das medidas tomadas para reduzir o seu défice financeiro, este persiste desde 2013 e foi estimado em quase 2,7 mil milhões de dólares no final de 2022. De facto, se forem tomadas medidas para lançar as bases para um crescimento sustentado, que cria empregos (com melhor inclusão na segurança social) forem tomadas pelo governo, o sistema poderá recuperar o seu equilíbrio a curto e médio prazo. Contudo, o problema do envelhecimento da população, que poderá ocorrer dentro de algumas décadas, lembra a necessidade urgente de reformas estruturais.

Desenho/Metodologia/Abordagem: O desenho do estudo é descritivo e analítico. Os dados para este estudo foram recolhidos de fontes oficiais argelinas, nomeadamente a NRF e a NOS, enquanto a análise de conteúdo foi realizada através da interpretação desses dados.

Constatações: Os resultados deste estudo mostram que as autoridades públicas argelinas tomaram muitas medidas nos últimos anos para colmatar o défice do sistema de pensões, das quais a revogação no final de 2016 das pensões de idade precoce e incondicional com a possibilidade de manutenção a actividade até aos 65 anos, a criação do NPRF em 2006, a introdução de receitas adicionais provenientes dos direitos aduaneiros aplicados às operações de importação de mercadorias a partir de 2020, e a introdução do NSSF em 2021. No entanto, isto não escaparia de forma alguma ao insolvência do regime de pensões, daí a necessidade de uma reforma estrutural que vise além das alterações paramétricas, a introdução de uma dose de capitalização complementar ao actual sistema de pensões (pensão complementar) para o seu reequilíbrio no curto, médio e longo prazo.

Conclusão: a disponibilidade de receitas petrolíferas substanciais pode minimizar a importância dos problemas financeiros enfrentados pelo sistema de pensões argelino e o seu impacto na estabilidade orçamental (de acordo com a NRF, o défice do fundo situou-se em 376 mil milhões de DZD em 2022 e poderá atingir 1,200 mil milhões de DZD em 2030), enquanto este boom petrolífero deveria ser utilizado para financiar a transição através da adopção de um regime de pensões parcialmente financiado. Ao mesmo tempo, isto exigiria mais esforços para aumentar o mercado de ações, a fim de criar um ambiente propício ao estabelecimento e desenvolvimento deste pilar financiado.

Palavras-chave: Sistema Previdenciário Argelino, Sistema Bismarckiano, Pensão Financiada, Pareto Optimum.

FINANCIACIÓN DEL SISTEMA DE PENSIONES DÉFICIT: REFORMAS ESTRUCTURALES QUE IMPLICAN NECESARIAMENTE UNA PRIVATIZACIÓN PARCIAL DE LAS PENSIONES EN ARGELIA

RESUMEN

Propósito: El objetivo de este trabajo es resaltar las diversas medidas de reforma que deben emprenderse para garantizar la sostenibilidad de los planes generales de pensiones, en particular aquellos destinados a promover la capitalización parcial de las pensiones en Argelia.

Marco teórico: Como la mayoría de los países del mundo, el sistema de pensiones argelino, que se gestiona según el sistema de reparto, enfrenta actualmente importantes problemas de financiación. De hecho, a pesar de las medidas adoptadas para reducir su déficit financiero, este último persiste desde 2013 y se estima en casi 2.700 millones de dólares a finales de 2022. De hecho, si se toman medidas para sentar las bases de un crecimiento sostenido que cree empleo (con una mejor inclusión en la seguridad social), son asumidos por el gobierno, el sistema podría recuperar su equilibrio en el corto y mediano plazo. Sin embargo, el problema del envejecimiento de la población, que podría ocurrir en unas pocas décadas, recuerda la necesidad urgente de reformas estructurales.

Diseño/Metodología/Enfoque: El diseño del estudio es descriptivo y analítico. Los datos para este estudio se obtuvieron de fuentes oficiales argelinas, concretamente la NRF y la NOS, mientras que el análisis de contenido se realizó mediante la interpretación de estos datos.

Conclusiones: Los resultados de este estudio muestran que las autoridades públicas argelinas han tomado muchas medidas en los últimos años para cubrir el déficit del sistema de pensiones, entre ellas la derogación a finales de 2016 de las pensiones de vejez anticipadas e incondicionales con posibilidad de mantener la actividad hasta los 65 años, la creación del NPRF en 2006, la introducción de ingresos adicionales procedentes de derechos de aduana aplicados a las operaciones de importación de mercancías a partir de 2020 y la introducción del NSSF en 2021. Sin embargo, esto de ninguna manera escaparía a la insolvencia del sistema de pensiones, de ahí la necesidad de

una reforma estructural que tenga como objetivo, además de cambios paramétricos, la introducción de una dosis de capitalización que complemente el actual sistema de pensiones (pensión complementaria) para su reequilibrio en el corto, medio y largo plazo.

Conclusión: la disponibilidad de importantes ingresos petroleros puede restar importancia a los problemas financieros que enfrenta el sistema de pensiones argelino y su impacto en la estabilidad presupuestaria (según el NRF, el déficit del fondo ascendió a 376 mil millones de DZD en 2022 y podría alcanzar 1,2 billones de DZD en 2030), mientras que este auge petrolero debería utilizarse para financiar la transición mediante la adopción de un plan de pensiones parcialmente financiado. Al mismo tiempo, esto requeriría mayores esfuerzos para impulsar el mercado de valores con el fin de crear un entorno propicio para el establecimiento y desarrollo de este pilar financiado.

Palabras clave: Sistema de Pensiones Argelino, Sistema Bismarckiano, Pensión Capitalizada, Óptimo de Pareto.

INTRODUCTION

Promising a retirement pension amounts to organizing an intergenerational transfer. You contribute (or pay premiums) as long as you are an active worker in order to be able to benefit from a replacement income when you retire. There are two major pension financing systems. They use the following actuarial techniques:

- The contributions collected during the year are used to pay the pensions due during the same year. No reserves are therefore built up. This is known as pay-as-you-go;
- The contributions paid by active people are set aside to pay their pensions when they stop working. This is known as the Funded Method.

With pay-as-you-go, we solve the problem of the first generation, but at the expense of a possible last generation. There is indeed intergenerational solidarity here. Funded Method, on the other hand, does not solve the problem of the first generation, unless you accept an additional initial cost, but it does preserve the rights of future generations, including the last. Intergenerational solidarity would appear to be non-existent in this case.

Indeed, since the early 1980s, many countries have introduced reforms to their general and mandatory pension systems (Schwarz & Demirguc-Kunt, 1999). The strategies vary considerably, but what they have in common is that they are motivated by the need to deal with financial problems and the budgetary consequences of generous pay-as-you-go schemes which, given current international patterns and demographic structures, are accumulating large liabilities that are unsustainable, especially as problems of equity, efficiency, governance and administration are widespread.

In doing so, reforms have often served other purposes, such as reducing the negative effects of redistributive transfers between and within generations, mitigating distortions in

labour markets and savings decisions, and in some cases contributing to the development of the financial sector and economic growth.

As is the case in other parts of the world, Algeria's pay-as-you-go pension system is unable to ensure intergenerational equity and is currently experiencing major funding difficulties. This system covers around 70% of the employed population, with expenditure in terms of GDP hovering around 7.5% in 2020. As a result, the NRF incurred a significant deficit of 640 billion DZD, or almost 3.5% of GDP.

The introduction of parametric reforms could alleviate the problem of financing pensions in the short and medium term. Nevertheless, the use of an overall mixed system in which capitalization plays an important role could help to rebalance the system and ensure its sustainability in the long term. In the light of this remarkable turnaround in the financial situation of Algeria's pension system, it would be necessary to focus on the main demographic, economic and social problems which are at the origin of this financial imbalance and to propose, for therefore, appropriate solutions.

LITERATURE REVIEW

A number of studies dealing with the issue of the solvency of general pension schemes around the world will be presented in what follows.

Pay-as-you-go pension systems have long been criticized. In the 1970s and 1980s, critics argued that PAYG systems lead to: (i) a decline in savings; (ii) a slowdown in capital accumulation; (iii) and make contributions to maintain the system's equilibrium more costly than in a fully funded system (Feldstein, 1974). Subsequently, demographic changes marked by an increase in life expectancy and a fall in fertility rates in most countries have been put forward to reinforce the first argument.

(Piñera, 1995) also criticizes PAYG scheme, claiming that its principles lead to major funding deficits. According to him, the PAYG system works in an environment similar to that of the 19th century, when life expectancy was low and the population was younger, and therefore does not work well in an environment in which the ratio Contributors/Retirees is deteriorating more and more. For Piñera, capitalization is therefore the system best suited to government budgets because it provides better returns on retirement income.

According to (Willmore, 1999), in a PAYG pension system, the difficulty lies in the fact that contributors are not treated in the same way because benefits are not closely linked to

contributions, so that some participants receive a high return to the detriment of others who receive a low or even negative return on their contributions.

For (Algava & Plane, 2004), the outlook for pension expenditure worldwide is on an upward trend. In industrialized countries, pension spending as a proportion of GDP is set to rise significantly over the medium and long term. It is set to rise to very high levels, reaching 17.4% in France and Germany and 17.8% in the UK by 2050.

(Feldstein, 2005) also points out that PAYG has major undesirable effects on work incentives and therefore on economic performance: (i) unemployment insurance programs increase unemployment; (ii) retirement pensions encourage early retirement and depress savings; (iii) health insurance programs increase medical costs, at a time when governments are seeking to reduce waste and poor macroeconomic performances, as well as the cost of an ageing population.

According to (Abdelmadjid Messaoudi, 2008) and (Bougarne & Allam, 2019), PAYG systems are generous and unsustainable because the ageing of the population is creating serious problems for their financial equilibrium. In addition to the contribution of public authorities and parametric changes, capitalization could therefore provide a partial solution to counter these financial consequences over the medium and long term.

MATERIAL AND METHODOLOGY

The methodology of the study is descriptive and analytical. Its main objective is to provide an overview of the Algerian pension system and to explain the advantages of introducing a hybrid pension system, as well as to contribute to the national literature on the subject. Data for this study were collected from official sources, namely the NRF and the NOS.

Evolution of the Pension System in Algeria

As an integral part of social security, the national pension system has, since its creation, evolved according to the evolution experienced by the country at the economic and social levels. Indeed, social security in Algeria was introduced by Decision No.49/045 of April 11, 1949 made enforceable by the decree of June 10, 1949.

Since the country's independence in 1962, major improvements have been made to this system, including in particular the trend towards generalizing social protection by extending it to broad categories and simplifying the formalities for opening up entitlements.

The overhaul adopted by the laws of July 2, 1983, had the objective, among other things, of putting an end to the various legislative and regulatory texts whose characteristics were presented by:

- The plurality of social security schemes;
- The multitude of funds;
- Disparities in the benefits provided from one sector of activity to another.

Indeed, laws No. 83-11 and 83-12 were intended to respectively establish a single social insurance scheme managed by the National Fund for Social Insurance, Work Accidents and Occupational Diseases (NFSIWA) ; and a single pension scheme managed by the National Retirement Fund (NRF)^D.

A National Commission for the Reorganization of Social Security NCRSS was responsible for proposing to the Ministry of Labor and Social Affairs measures to reorganize the social security system in Algeria. As a result, and following the dissolution of the social security schemes, the activities devolved and managed by the self-employed scheme (which has existed in Algeria since 1958) have been transferred as follows:

- The “Sickness, Maternity, Invalidity and Death” social insurance component assigned to the NFSIWA;
- The “Retirement” component transferred to the NRF.

It is therefore by analogy that the provisions of these laws have been extended to non-salaried workers, with in particular certain specificities fixed by Decree No. 85-35 of February 09, 1985 relating to the social security of persons exercising a non-salaried professional activity.

Given the shortcomings observed during the operation of the single social insurance and pension scheme as part of the overhaul of the social security system, it can be concluded that the unification reforms envisaged in the early 1980s did not produce the expected results and the 2 national funds, NFSIWA and NRF, which were created in 1985, were unable to achieve their objectives.

Towards the beginning of the 1990s, these funds showed their limits and it turned out that they were incapable of taking charge of all the insured persons, in particular the NFSIWA (financial impact of debts to foreign hospitals, management inefficient administration, etc.). However, with regard to the category of non-employees, this was neglected for some time, the single system as it was designed could no longer control and manage a large part of the non-employees, particularly in terms of:

^D See Decree No. 85-223 of August 20, 1985 on the administrative organization of social security.

- Collection of annual contributions;
- Census and update of the membership file (identify and enhance the potential of the existing self-employed population);
- Support for new affiliates belonging to this scheme.

Faced with the absence of legislative texts governing this specific category of social insured, it was agreed to relaunch and restart self-employed activity by creating a new national fund, by executive decree No. 92-07 of January 4, 1992, which will henceforth take charge of the non-salaried population independently of the NFSS, called the National Social Security Office of the Non Wage-Earned Persons.

Indeed, Algeria's pension system, applicable from January 1, 1984, is an insurance-based, contributory system, characterized by solidarity between working people and pensioners, and therefore operates on a pay-as-you-go basis^E.

The provisions of articles 1 and 2 of law No. 83-12 define the purpose and principles of this law, namely:

- A single scheme for all employees;
- Uniform rules for assessing entitlements;
- Uniform rules for assessing benefits;
- Standardized funding.

In addition to these principles, our pension system is characterized by:

- The scope of protection it covers, i.e. the employees concerned by the provisions of this law (all workers regardless of their sectors of activity);
- A level of service qualified as very high (up to 80% or even 100% of the salary);
- Unification of the legal retirement age at 60, with however certain derogations or bonuses for specific categories (women workers, mujahideen, etc.);
- Institution of a minimum pension (currently 75% of the GNMW);
- Fixing of a “maximum” career duration, relatively short, i.e. 32 years;
- Calculation of the pension on the average salary of the 5 best years of the career;
- The rate of survivors' pensions (up to 90% of the deceased's pension);
- Annual revaluation of retirement pensions and allowances.

^E This system operates on the pay-as-you-go principle. This financing technique is based on intergenerational equity, in which financial balance is achieved if the amount of contributions is equal to the amount of benefits provided. This equity is verified by the following formula: $[\tau_t W_t N_t = \lambda_t W_{t-1} N_{t-1} + k.dp]$ where $k > 0$ with τ_t : contribution rate, W_t : salary received by worker, λ_t : replacement rate, N_t : number of contributors, W_{t-1} : contributory earnings, N_{t-1} : number of pensioners, dp : operating expenditures.

It should also be noted that Algeria has another scheme for Senior Officials of the State, whose retirement pension is equal to their last net salary (pension rate equal to 100%), and is paid by the Special Retirement Fund SRF (the special scheme introduced by Decree No. 80-53 of March 8, 1980).

We can therefore see the extent of the cover provided by the system and the high level of benefits it provides to its beneficiaries. In fact, our pension system for employees is one of the most generous in the world (Abdelmadjid Messaoudi, 2008). This explains why employees have not expressed any need for a supplementary pension.

Today, after 32 years of contributions, employees can claim a pension corresponding to a replacement rate equal to 80% of their average remuneration over the best 5 years of work. Elsewhere, in France for example, after 40 years of service, the employee is entitled to a pension corresponding to 50% of the average of the best 25 years of work (the average of this rate is 57% in high-income OECD countries). In the latter case, a supplementary pension is essential.

This pay-as-you-go system, which does not build up reserves and immediately distributes the contributions of working people to retirees, solves the problem of the so-called first generation, whose members will receive pensions whose current value exceeds that of the contributions they will only pay during part of their career, or which they will not have paid at all if they have already reached retirement age. This first generation is therefore receiving a "gift" that we can assume will have to be paid for by subsequent generations. In any case, it would have to be paid for by the last generation of pensioners, even if in the future there are no longer any active contributors. This is the problem of the last generation, and pay-as-you-go means that the system must be sustainable. For this to happen, a pay-as-you-go pension system must have stable funding, because a system with benefits of this kind must take account of the financial capacity available to it to meet its short, medium and long-term commitments to its members.

A Pension System in Financial Difficulty

The balance of the pay-as-you-go pension system is linked to future demographic trends and the state of the labour market. The size of the funding requirement depends to a large extent on the relative weight of the working population and that of retirees, in order to guarantee intergenerational equity. In other words, maintaining pension payments without increasing the contributions of active workers.

The reality is quite different, as Table 1 below clearly shows. From 2013 onwards, the NRF's financial situation began to show a deficit which has not stopped growing, given the decline in the demographic ratio of contributors to retirees (from 1988 to 2020), bearing in mind that a pension generated, whatever the system, is covered until the rights are extinguished.

Table 1: Evolution of the NRF's financial situation (1990-2020)

Year	1990	1995	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
Receipts 10 ⁹ DA	7,67	35,62	52,36	62,32	135	141,3	148,7	183,46	190,11	204,15	244,91	284,4
Expenditures 10 ⁹ DA	9,49	38,73	73,47	93,39	127,78	143,07	145,44	172,3	186,93	212,87	250,72	278,26
Balance 10 ⁹ DA	-1,82	-3,11	-21,11	-31,07	7,22	-1,77	3,26	11,16	3,18	-8,72	-5,81	6,14
Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Receipts 10 ⁹ DA	317,55	361	465,4	673,9	669,6	648	668,5	695,8	689,6	640	709	762
Expenditures 10 ⁹ DA	298,75	351,1	398,1	567,4	678,8	803,1	931,6	1032,6	1168,7	1200	1293	1402
Balance 10 ⁹ DA	18,8	9,9	67,3	106,5	-9,2	-155,1	-263,1	-336,8	-479,1	-560	-584	-640

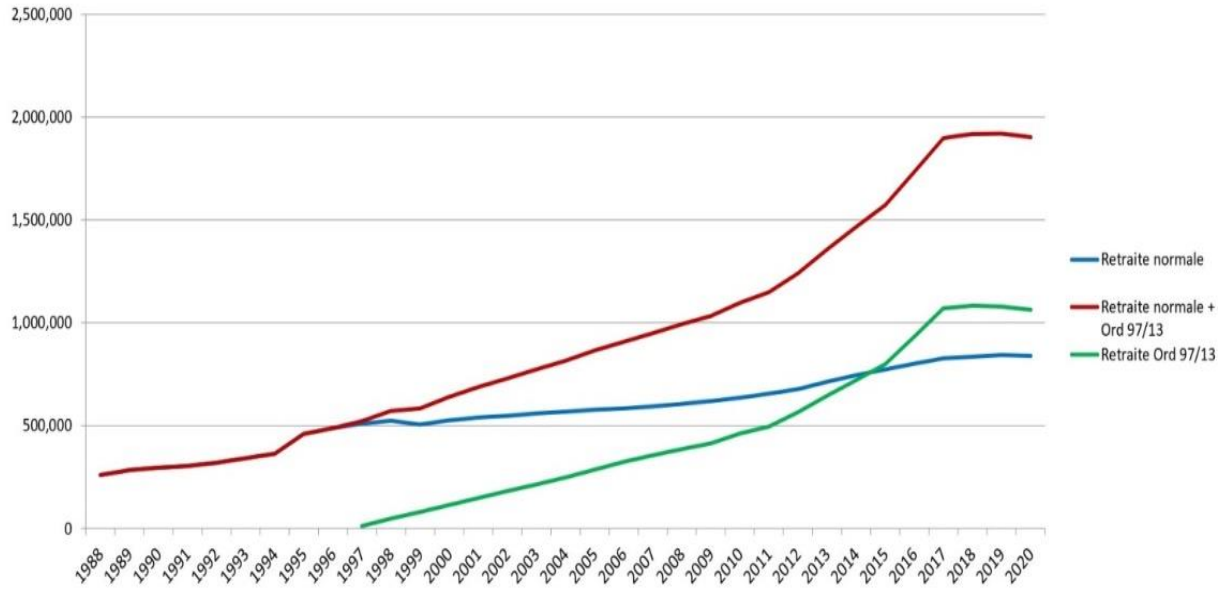
Source: Developed by ourselves based on NOS and NRF data

In fact, the volume of NRF expenditure has increased at an annual rate of 14.85% between 2010 and 2020, rising from 351.1 billion DZD in 2010 to 1402 billion DZD in 2020, which is due, on the one hand, to the almost exponential growth in the number of pensioners since the introduction of retirement before the legal age (60), particularly under Ordinance No. 97-13 (see Figure 1), and, on the other hand, to the measures taken by the government to improve the purchasing power of pensioners, in this case:

- Increase of the minimum pension amount (increase of the GNMW twice with rates of 25% and 20%);
- Exceptional revaluation of pensions and retirement allowances by 30% in 2012;
- Annual revaluation;
- Massive retirements recorded in 2016 under Order No. 97-13 on the eve of its repeal.

This financial situation had often forced the NRF to call on the State Budget for advances to cover its deficit.

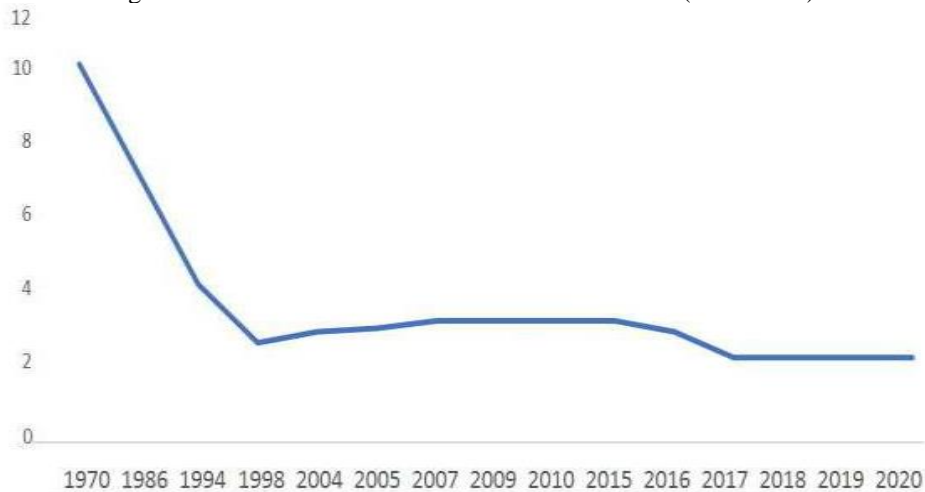
Figure 1: Evolution of the population of retirees (direct rights) (1988-2020)



Source : (Djaafar ABDELLEI, 2021)

As for the Contributors/Pensioners ratio, figure 2 below shows a continuous decrease in this statistic. Over 50 years, we have gone from 10 contributors for each retiree to only 2 per retiree.

Figure 2: Evolution of the Contributors/Retirees ratio (1970-2020)



Source : (Djaafar ABDELLEI, 2021)

Under current conditions, it is essential for there to be at least 4 contributors for one pensioner to ensure the balance of the pension scheme (Djaafar ABDELLEI, 2021). This is something that the government can work on by trying to take the necessary measures to include undeclared workers in the social security system.

Data published by the NOS on the number of unregistered workers in the social security system show that workers in the trade, services, construction and agriculture sectors make up the majority of unregistered workers, and that the problem arises mainly in the private sector whose share represented approximately 55% of the total of the sector in 2018.

Thus, the level of unemployment reached during the period 1988-2020^F, coupled with the problem of workers not joining the social security fund as a result of the proliferation of informal employment, has led to a weakening of the NRF's resources. This suggests that more jobs need to be created: "If more young unemployed people could find work, their contributions would help to replenish the pension funds in the short and medium term, given that the Algerian population is still young and the problem of ageing is far from over".

The ageing of the population is a global phenomenon that is most acute in industrialized countries. By 2050, the number of people aged 60 and over will reach 2 billion, more than three times the current figure. Algeria will be no exception, even if its current population is relatively young (U.S. CENSUS Bureau, s.d.).

All of this is decisive for the future of a pension scheme financed on a pure pay-as-you-go basis. In fact, the increase in the population aged 60 and over will affect the level of pension expenditure and if this is accompanied by an increase in the dependency ratio, i.e. people of pensionable age compared to the population of working age, the problem is becoming even more acute (see table 2 below).

Table 2: Evolution of the old-age dependency ratio POP 60+/POP15-59 (1988-2050)

Year	1988	1998	2008	2018	2025	2028	2035	2038	2048	2050
Dependency ratio	11,25%	10,68%	10,79%	14,37%	19,16%	21,63%	28,40%	32,20%	49,26%	52,45%

Source : U.S. CENSUS Bureau, International Data Base

The table above shows a stable upward trend in the percentage of the population aged 60 and over in relation to those aged between [15, 59] until 2028, after which this percentage increases at an accelerated rate to reach, by the end of the projection period in 2050, almost 5 times its 2008 level.

In fact, these projections show that the population of pensionable age will represent more than half of that of working age in 2050, and as the retired and contributing population is an integral part of this population, it will automatically suffer the same fate.

^F This is a direct consequence of the impact of the structural adjustment plans of the 1990s on social protection (falling wages, mass redundancies of workers in public companies).

It is also important to study this change in demographic structure by sex, given that women generally retire before men, which can have a negative impact on the financial situation of such pension schemes.

Table 3: Evolution of the total Algerian population by sex (1988 to 2050)

Year	1988	1998	2008	2018	2028	2035	2038	2048	2050
Men %	50,36	50,41	50,36	50,3	50,19	50,05	49,98	49,68	49,62
Women %	49,64	49,59	49,64	49,7	49,81	49,95	50,02	50,32	50,38

Source : U.S. CENSUS Bureau, International Data Base

This table shows that the percentage of men is slightly higher than that of women but that this situation will no longer be from 2038, still according to projections, because the female workforce will exceed 50%, which will force the authorities to take into account of these developments in the reforms that should be made to the pension system.

The strong and regular increase in average life expectancy at birth, for several years, which could still exceed 80 years according to CENSUS projections by 2050, as well as a drop in fertility which will stand at 2,1 in all countries of the world by 2050, according to the United Nations hypothesis, are other factors that must be taken into account for any reform policy in the future.

Faced with the various challenges and financial difficulties facing our pension system, the public authorities have taken many measures, including (Djaafar ABDELLI, 2021):

- Promulgation on December 31, 2016 of law No. 16-15 amending and supplementing law No. 83-12 relating to retirement, which has the effect of:
 - Repeal of Ordinance No. 97-13;
 - Possibility of maintaining activity until the age of 65.
- Establishment of additional revenue (non-contributory): customs tax applicable to import operations of goods released for consumption at the rate of 1% in 2018, then 2% from 2020;
- A call for inter-fund solidarity, from 2015 to 2017, to deal with the deficit;
- Exceptional State contribution of around 500 billion DZD in 2018;
- Borrowing from the National Investment Fund NIF, since 2019;
- Establishment of the National Pension Reserve Fund NPRF in 2006, financed by 3% of oil taxes;
- Implementation since July 2021 of the National Social Security Fund NSSF to finance the imbalance in social security funds.

The Algerian government's decision to resort to other sources of funding to make up the deficit in the pension system will in no way enable it to escape insolvency, hence the need for structural reform. It is imperative that reforms are undertaken before the situation becomes even more complicated. Firstly, emphasis must be placed on preparing initial baseline data so that a proper assessment can be made of the financial problems facing the pension scheme. Without this baseline data, it is not possible to begin debating the costs and benefits of different reform packages before moving from strategic guidelines to a detailed reform program.

In addition to parametric reforms, many countries have decided to introduce a dose of capitalization to supplement the current pension system (supplementary retirement) in order to rebalance it in the short and medium term. It would be very important to carry out a study in the Algerian context to examine the impact of such a reform.

The Main Options for Reforming the Pay-As-You-Go Pension System

There are basically three “03” main pension reform options:

The first consists of a reform of the pay-as-you-go system by modifying its parameters such as retirement age, contribution annuity rate, length of the reference period for calculating pensions, indexing, etc. It is even possible to opt for a notional defined contribution account approach (NDC), which adopts the vocabulary of individual accounts financed by capitalization and uses it to set the commitments of the pay-as-you-go system. In doing so, it makes explicit the implicit actuarial calculations of the system. This increased transparency helps both policy makers and the public to better understand the trade-offs inherent in any pay-as-you-go system^G. A serious credibility problem explains why individuals are tempted to oppose from the outset the alleged parametric reforms carried out by politicians for electoral purposes.

The second consists of a rapid and complete transition to a mandatory capitalization system that solves, in principle, most issues of redistribution, saving and intergenerational equity, etc. However, there are three major problems with this solution. The first of these concerns the repayment of the implicit debt that represents not only the commitment to current pensioners, but also to workers who have acquired rights under the pay-as-you-go system. The

^G In a NDC system, a long-term contribution rate is set. Each year, contributions are recorded in the account of each contributor, as if they were contributions to a funded account. What's more, each year the account grows according to a "notional rate of return". The latter may represent GDP growth, average wage growth, or total wage growth, all of which have different budgetary consequences in the event of a demographic, salary or employment shock. Upon retirement, the amount accumulated in an account is paid out in the form of a life annuity, calculated on the basis of an implicit interest rate and mortality tables specific to the different cohorts, as for a funded account. As the mortality tables are adjusted to reflect the increase in longevity, the effects of the latter are automatically incorporated into the pension system.

second problem is whether the financial infrastructure, regulatory capacity and political and administrative decision-making mechanisms are up to the task. The third issue is whether the risks of financial market fluctuations are adequately and explicitly addressed.

Finally, the third option consists of a gradual transition to a multi-pillar system, combining both pay-as-you-go and funded pensions, whose combination must depend on the initial situation of the various countries as well as the constraints to which the financing of the transition is subject.

Faced with these options, international institutions, in particular the World Bank (WB), have declared themselves in favour of the multi-pillar approach, provided that it is applied pragmatically and with respect for specific national circumstances (Holzmann, 2000). Admittedly, the problems raised by the first 2 options also arise, but they are reduced and more easily manageable as part of a gradual and partial approach to privatization.

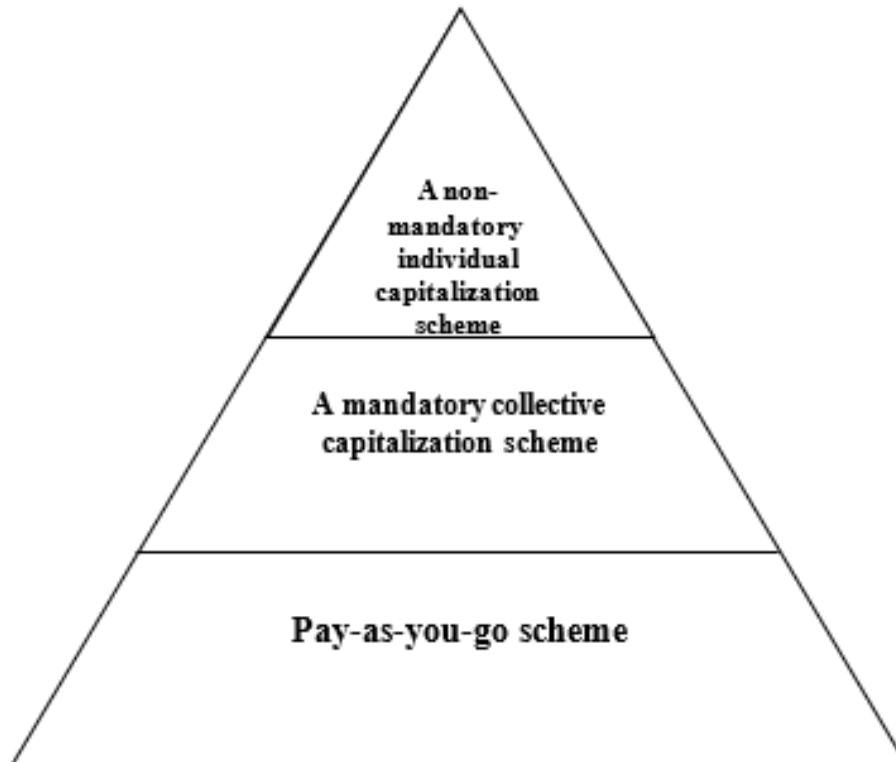
For their part, the International Labour Organization (ILO) and the International Social Security Association (ISSA), while being aware of the problems that are causing the financial imbalances of pension systems, have always opposed the development of the funded pension system to the detriment of the pay-as-you-go system. They advocate maintaining the financing of old-age insurance as a societal objective, the priority of which is to guarantee a minimum retirement income financed on a pay-as-you-go basis.

At the heart of the actuarial, economic and political debates relating to the reforms, we inevitably find the question of inequalities, which we know have grown steadily since the mid-1970s, affecting, among others, several categories of the elderly, and especially older women. From this perspective, the multi-pillar system appears to be effective.

The Multi-Pillar System: A vehicle for Pension Reform that Improves Social Welfare

The difficulties of reforming both pay-as-you-go and funded schemes naturally lead to close attention to the third major reform approach, namely the introduction of multi-pillar (often 03 pillars) schemes, part of which (mandatory) is funded on a pay-as-you-go basis and another part, distinct and separate, is financed by capitalization (see the following diagram).

Figure 3 : The three-pillar retirement pyramid



Source : Developed by ourselves based on WB definition

These systems already exist, on a mandatory or contractual basis, in developed countries such as Australia, Denmark, the Netherlands, Switzerland and the United Kingdom (Queisser, 1998). Most of the reforms carried out during the 1980s and 1990s in Latin America and Eastern Europe were also based on this approach.

The main questions here relate to the socio-economic implications of such an approach to pension reform. Of course, no pension reform achieves a Pareto optimum, because even if future generations are better off overall at some point, the consumption of at least one individual will suffer from any reform.

However, a reform inspired by the multi-pillar system can have positive social benefits. Firstly, it makes it possible to distinguish between the objective of combating poverty and that of compensating for loss of income. Secondly, it incorporates risk diversification into national provisions for retirement income support. Another advantage is that it minimizes the budgetary burden of the transition while preserving the economic gains of fully funded systems. Finally, it brings to the reform debate some obvious benefits for young workers and for those hit hard by globalization.

The multi-pillar approach thus allows a reforming country to distinguish between the objectives of combating poverty and those of income replacement. The first objective can be

achieved through relatively limited pay-as-you-go schemes or through an assistance benefit financed from the State Budget. The income replacement objective can be assigned to a mandatory funded pension system, with contribution rates included, say, between 10 and 13% (Holzmann, 2000).

Unfortunately, most reforming countries have so far chosen to target relatively high replacement rates, leaving the pay-as-you-go pillar with the dual responsibility of fighting poverty and contributing to income replacement.

The main advantage of a multi-pillar scheme actually lies in risk diversification. The entire portfolio of pensioners' assets is not held hostage to political and demographic risks, not least because the pay-as-you-go system no longer weighs as heavily as it once did in national public finances.

As pointed out earlier, almost all the questions that arise in relation to prudential regulation, the development of capital markets and market fluctuations also arise with the multi-pillar approach and require answers. But, because it is now just one element among others, the funded pillar can operate with fewer constraints from the administration on the long-term investment opportunities available to contributors.

More importantly, the multi-pillar approach recognizes that countries face all kinds of risks over the long term, and that a single instrument cannot fully anticipate all of these risks. In fact, some non-systemic risks, such as natural or financial disasters, are impossible to mitigate through diversification. The table below summarizes how the multi-pillar approach balances long-term risks.

Table 4: The sensitivity analysis to main risks

	Pay-as-you-go schemes	Funded schemes
Macro-economic risks		
Negative shocks on GDP	Reduction in revenue, but the impact on individuals can be offset	Possible funding effects that cannot be offset
Unemployment	Reduction in revenue, but the impact on individuals can be offset	No effect on funding, but concerned individuals will receive lower benefits
Low wage growth	Reduction in revenue, but the impact on individuals can be offset	No effect on funding or current level of benefits
Financial crisis (depression, war, hyperinflation, natural disaster)	Possible decrease in revenue, but the impact on individuals can be offset	Reduction, or even disappearance, of accumulated reserves
Low rate of return	No direct effect on funding or benefits	No effect on funding but reduction in benefits
Demographic risks		
Increase in the dependency rate	Funding deterioration	No direct effect on funding level or benefits

Reduction in the active population	Increase in the level of wages and future benefits	Decrease in yield and future benefits
Political risks		
Change of contracts	Easy	Difficult
Sensitivity to short and long-term budget constraints	Strong	Weak

Source : (Holzmann, 2000)

In purely economic terms, a portfolio of pension assets (PAYG) and financial assets (funded pension) can increase social well-being by reducing the risk of income loss. If financial assets are closely correlated at the international level, this is not the case for national wages or the national and international financial markets. As a result, a multi-pillar scheme offers a better risk/return balance than a single-pillar scheme, even if it is an international financial portfolio (and even if currency risk is disregarded). It's better not to put all your eggs in the same basket, even if it's an international basket.

The Implementation of Reforms in Bismarckian Systems

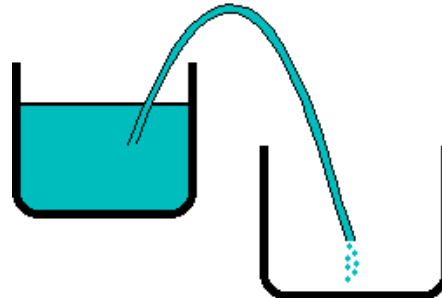
Identifying a dominant approach to reform is not the same as implementing it in a country. Indeed, this is a process that requires flexibility in the face of national preferences and circumstances (it must reflect the country's preferences and be credible with its population). The implementation of pension reforms in a country is often accompanied by international institutions, mainly the WB, because it requires a complex and comprehensive range of instruments, ranging from assistance in setting the parameters of schemes to obtaining correct projections, from improving public institutions to communicating and improving the perception of the effects of the reform, especially by the financial markets.

However, the reforms that have proliferated since the late 1980s seem to us to have created an opportunity to not only adapt but also restructure pension systems, with a greater role for the mechanisms of capitalization. In fact, despite the major institutional differences that characterize these reforming countries, the developments of the 1990s are part of a common logic, which sees a reduction in relative terms, in the importance of PAYG system, as a means of financing the financial transfer to the elderly, in favor of capitalization (Palier & Bonoli, 1999).

The hypothesis presented here is that each country follows its own path to reform its pension system, but within a new common landscape, structured by a global model in which capitalization plays an important role. The gradual transformation of all pension systems is based on the same « **communicating vessels** » mechanism, which proceeds in two stages.

Firstly, the level of replacement offered by basic collective pensions is reduced. This withdrawal of the basic schemes therefore offers a space for the development of supplementary funded pensions (the following diagram illustrates this operation).

Figure 4 : The principle of communicating vessels



Source : Developed by ourselves

Reduce the Content of the First Vessel to Increase that of the Second

Indeed, this general scheme is embodied differently depending on the pension systems: everywhere the pensions served by the basic schemes are or will be reduced, but the withdrawal of the basic schemes takes place by the introduction of targeting in the Beveridgian schemes^H, through increased selectivity in already means-tested schemes (Sweden in 1998), and by increasing contributivity in PAYG old-age insurance systems. However, the development of funded pensions does not take the same forms and is not at the same stage depending on the country (privatization of public pensions, or development of funded corporate pensions, or opening of individual accounts in a reserve fund, or legislative and fiscal support for the development of voluntary retirement savings).

Similarly, in the case of the Bismarckian pension systems^I, the reduction in benefits, which are generally generous and financed on a pay-as-you-go basis, has involved a gradual change in the calculation rules, negotiated with the social partners. The calculation of retirement pensions has gradually been changed by strengthening the link between contributions actually paid and benefits received. Instead of being expressed as a proportion of a reference salary (the amount of the pension represents X% of the Y best years), benefits are increasingly calculated

^H In so-called Beveridgian schemes (named after Lord Beveridge, the father of the British model), guarantees are given to all citizens in order to prevent them from falling into poverty or from not having access to essential care, hence the name "universal system". The latter is no more than a minimum safety net: it is guaranteed by the State and financed by taxpayers. It may take the form of a public health service financed by the State Budget.

^I In the Bismarckian schemes (modelled on the German system introduced by Chancellor Bismarck in 1880), benefits are granted to those who work, hence the name "professional system". Health and old-age insurance were financed by contributions based on wages. The Bismarckian system is therefore clearly insurance-based and contributory.

on the basis of the actual amount of social contributions paid during working life. We are thus moving from defined-benefit systems to defined-contribution systems.

However, the withdrawal of basic benefits, generally organized in a fragmented system, is often accompanied by the introduction of a legislative framework allowing the generalization and development of individual pension schemes, most often voluntary, financed by capitalization. Most of the reforms carried out in Europe during the 1990s were based on this approach (Palier & Bonoli, 2000).

Following the reforms introduced in the Bismarckian countries between 1989 and 1993: in Italy, Germany and France, this condition is beginning to be met. This does not mean, however, that private pension funds will automatically develop. There are still many obstacles to their development. The first of these is the strong political and social legitimacy of pay-as-you-go systems in continental countries.

The Role of Life Insurance and Pension Funds in the Partial Privatization of Pensions

In countries with a pure pay-as-you-go system, such as Algeria, pension contributions are, by design and in principle, equal each year to the pensions paid. Wealthy "baby-boom" households also accumulate financial savings, not in pension funds, but through unit-linked life insurance policies (UCITS).

In Algeria, a diversification of pension management methods, by creating public and private pension funds, could have a positive influence on the governance and management of retirement, which will be based on financial savings transiting on the stock market (Abdelmadjid Messaoudi, 2008).

Proponents of the gradual introduction of pension funds into the Algerian pension system put forward 4 types of arguments (Vernière, 2001):

- They would stimulate financial savings;
- They would allow our pension system to better absorb the demographic shock, caused by the deterioration of the Active/Retired ratio, the fall in the fertility rate and the increase in average life expectancy;
- Pay-as-you-go pensions are structurally less "profitable" than funded pensions (you have to contribute more to get the same pension);
- Finally, by investing in national companies, Algerian pension funds would stimulate national savings by encouraging households to subscribe to individual or collective investment plans, provided of course that this type of investment comes with

tax benefits and fairly low transaction and management fees, which are more than symbolic. Investment by pension funds can consequently and incidentally reduce speculation by individual domestic and foreign investors.

Indeed, in a funded pension system, contributors buy securities, but retirees sell them (Giraud, 2001). There are therefore no positive net savings in such a system unless contributions exceed pensions^J, a nuance must be made. Because, it is very likely that pension funds, thanks to the dynamics of the capital markets, in particular the equity market, are largely in surplus not because the labour force contributing is larger than the retirement population, but simply because the gains are very substantial.

In Algeria, the reduction of the basic benefit would certainly encourage households to look for the most profitable savings products to replace their future loss of income, and life insurance products could offer them a better investment. This would stimulate the exploitation of this insurable potential, under the supplementary pension with optional membership or that of company with compulsory membership, managed by life insurers as a first step, and then in conjunction with the pension funds that would have to be created accordingly.

However, for people to understand information about the insurance industry in general and life insurance in particular, insurers need to make efforts to communicate about products, services... (Thanh Loan, 2023). This means that they should implicitly make full use of all their distribution channels, including Bancassurance^K, in order to improve their productivity accordingly.

In fact, the development of life and health insurance, particularly those managed on a capitalization basis, is closely linked to the development of capital markets. This would require a sufficiently developed financial infrastructure and know-how to manage ever-growing financial assets. The capitalization of pensions has a considerable impact on the stock market and therefore on the economy as a whole, which will undoubtedly result in better pension returns. Hence the importance of continuing efforts to boost the stock market in order to create an environment conducive to the introduction and development of a funded pension pillar.

For example, the outstanding amount of life insurance contracts (mathematical provisions and provisions for profit-sharing) in France, at the end of 2022, totaled 2.108 billion euros, out of a total of 2.369 billion euros of all financial investments of the entire insurance market (Bank of France, 2023). A solid harvest of long-term savings, clearly demonstrating that

^J For example, when there are more contributors than pensioners.

^K Bancassurance indicates delivering insurance policies through banks, wherein banks sell the tied company's insurance products to their customers (Velmurugan, et al., 2023).

life insurance remains the preferred savings vehicle of the French, and gives it this colossal capacity to finance the economy.

However, the outstanding financial investments of the entire Algerian insurance market amounted to 302 billion DZD, at the end of 2021, including 195.46 billion DZD in government securities (Insurance Department, 2021), acquired through permanent participation in auction operations launched periodically by the public treasury. Such operations would undoubtedly make it possible to strengthen the financing of our national economy, but more efforts should be made in this direction (Omrani & Tahri, 2021).

Furthermore, the monetary authorities could consider removing all regulatory constraints that may weigh on the management of pension fund assets and deprive them of the benefits resulting from global diversification, in investments that are secure about the risks of default and stock market illiquidity.

CONCLUSION

As we have just seen, public pension schemes in several countries of the world expect a significant financial imbalance, no doubt accelerated by the rapid ageing of the population, especially in rich countries. However, many experts in the field remain hopeful that productivity gains that could offset the decline in the working population, although they expect that this will not be enough to eliminate the pressure on contributors.

Some even refuse, for reasons of uncertainty, to rely on productivity gains to improve the financial imbalance of public pension systems. We should also not expect to be able to reduce their deficits thanks to a favourable economic context to come. In fact, the economic situation improves only ephemerally (Fischer & Reisen, 1995).

The diagnosis of the retirement problem and the search for possible solutions are set against the backdrop of the theoretical debate between the advocates of efficiency and equity, the proponents of the minimal State and those who assign to the State a redistributive role with the aim of consolidating social cohesion and combating exclusion.

The reform measures recommended by the international monetary authorities are aimed at eliminating the deficit in pension systems, restoring their short-term viability and guaranteeing the long-term financing of a minimum level of old-age insurance, in a context of demographic ageing.

The World Bank (1994) has encouraged countries that are planning a substantial increase in their expenditure to limit the level of their commitments by adopting policies that

necessarily involve a three-pillar system (World Bank, 2002). The combination of the three pillars depends on the specific features of each country. According to (Queisser M. , 2000), this project was previously suggested by the International Labour Office (ILO) and the ISSA.

The Bretton Woods institutions argue that pension reform scenarios cannot be limited to changing only certain parameters of the general pay-as-you-go scheme. For example, raising contribution rates to balance net liabilities of public schemes will have an adverse effect on job creation, particularly for low-skilled and lower-paying jobs.

Moreover, raising contributions will have a negative impact on economic growth in countries with large public systems, which often means that the share of funded contributions is low. These countries will be forced to continuously increase contributions (the increase in contribution rates that Algeria made for 30 years^L was unable to solve the problem of the NRF's imbalance, and employers now feel that they have reached the limit and are rejecting this solution) to finance a pay-as-you-go system that is burdened by the pressures of an increasingly ageing population.

Furthermore, raising the retirement age is at odds with policies to create jobs for young people in countries with high unemployment rates^M. According to experts, the only effective solution lies in the market, in other words, in the individualization and partial capitalization of contributions.

In the case of Algeria, which is lagging behind on this front, the availability of substantial oil revenues may downplay the importance of the financial problems facing the pension system and their impact on budget stability (according to the NRF, the fund's deficit stood at 376 billion DZD in 2022 and could reach 1.200 billion DZD in 2030), whereas this oil boom could be used to finance the transition by adopting a partially funded pension scheme.

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^L The fraction of contribution allocated to the pension branch increased from 07% in 1985, for an overall contribution rate of 29%, to 18.75% in 2015, for an overall contribution rate of 34.5%.

^M In 2022, the unemployment rate in Algeria was relatively high at around 11.6%. The rate was even higher among the labour force aged between 15-24 years, at 29%, according to the WB.

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