

THE SOCIAL SECURITY PENSION SYSTEM OF NORTH CYPRUS: ANALYSIS OF DEFICITS AND INEQUITIES WITH PROPOSALS FOR SUSTAINABILITY AND FAIRNESS

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ABSTRACT

The Social Security Pension System of North Cyprus is experiencing a pronounced deficit, with a pattern of structural imbalances that necessitate immediate policy attention. Our analysis reveals a consistent deficit averaging 50% of social security pensions paid, or 3.2% of gross domestic product (GDP). Given the aspirations of North Cyprus to join the European Union, correction of these imbalances at an early date is imperative. Women, because of their longer expected lifespan, receive a 5% higher subsidy than men earning equal incomes through their working lives. However, lower-income individuals (often women) are at a critical disadvantage in terms of the monetary value of the subsidy received. The system's dependence on general budget financing points toward a non-sustainable future. At the same time the Provident Fund, to which all employees are required to contribute 8% of their declared incomes, is a systematic mechanism for reducing workers' savings in an inflationary environment. Workers contributing to the Provident Fund over the past 13 years will receive back from the government only between 40% and 49% of the value of what they could have cumulated from a 3% or 0% real return alternative investment that received the same tax treatment. This article crystallizes the critical findings and suggests policy recommendations for the substantial pension system reform that is necessary to ensure fiscal sustainability and equitable treatment of all income groups.

Keywords: Pension System Deficit, Fiscal Sustainability, North Cyprus Social Security, Pension Reform, Contribution Rates, Provident Fund Contributions

JEL Classification: H24, H26

1. Introduction

The social security landscape in North Cyprus is undergoing a period of significant strain. This paper presents an examination of the pension system's fiscal health, highlighting the emergent issues within its current operational framework. A worrying trend of increasing pension deficits undermines the system's integrity and sustainability. These deficits, significant in their magnitude, signal a deeper structural problem that transcends normal fluctuations in economic cycles or demographic shifts. Given the aspirations of North Cyprus to join the EU, correction of these imbalances at an early date is imperative.

The Social Security Pension System in North Cyprus plays a crucial role in providing income support to the retired elderly, particularly during inflationary periods. This system is designed to be inflation-indexed, meaning that pensions are adjusted to keep pace with rising prices. This mechanism ensures that retirees' purchasing power is preserved, making indexed social security pensions an important buffer against the eroding effects of inflation and the uncertainty of highly variable rates of inflation faced by many retired former employees. Since 2000 the mean annual rate of inflation over these 23 years has been 21% with a high standard deviation of 24%. This extreme volatility in purchasing power of fixed nominal sources of income of the retired is an issue that any responsible government needs to mitigate. This volatility means that people need to secure an investment return that approximately matches the inflation rate to maintain their purchasing power. It is not just about compensating for the current rates of inflation, but also about managing the risk that comes with inflation's unpredictability.

North Cyprus has no policy instruments for controlling the rate of inflation. It does not have its own currency, and the Turkish Lira (TL) is used in most day-to-day transactions. Significant government financial support is received from Turkey, and this is also paid in TL. Hence, the only action that the government can take is to try its best to mitigate the effects of inflation on its residents. To mitigate the impact of inflation, the salaries of public servants are generally indexed to reflect the rate of inflation experienced. Also, private employers tend to adjust the salaries of their employees over time for the cumulated inflation. Firms and individuals are allowed to hold their financial assets in a range of hard currencies. For sources of retirement income, however, it is only the publicly sponsored Social Security Pension System, which covers both public and private employees plus the self-employed, that is adjusted to reflect the current rate of inflation in

the economy. It can do this because, as a pay-as-you-go system, it receives contributions from the current employees to the system, and these are used to pay the pension payments of those who are retired.

In stark contrast, the Provident Fund, another component of the retirement income system in North Cyprus, does not offer this inflation protection. Compulsory contributions to the Provident Fund are made by both employees and their employers, but the invested balances in the fund are not adjusted for inflation. An interest rate is paid by the government on the balances, but this rate does not generally reflect the actual rate of inflation in the country. Consequently, during periods of high inflation, the real value of the Provident Fund diminishes significantly, as it fails to keep up with the rising cost of living. This differential approach to inflation adjustment between the Social Security Pension System and the Provident Fund highlights the disparity in the degree of protection the two schemes give to maintain the purchasing power of the retired over time. This underscores the vital role of the inflation-indexed social security pensions in safeguarding retirees' wellbeing in North Cyprus.

The importance of this issue cannot be overstated, as it touches upon the very fabric of social welfare and economic stability. The pension system, designed as a means of social security, is now posing an economic conundrum that requires immediate and thoughtful policy intervention. The following analysis is set against a backdrop of fiscal imbalances, with the aim of distilling the complexities of the pension system into actionable insights. It is imperative to understand that the conclusions drawn herein are not mere academic musings but are deeply rooted in the socio-economic realities of North Cyprus, with far-reaching implications for its populace and governance.

1.1. Historical Context, Challenges, and Reforms

The Social Security Pension System of North Cyprus has undergone significant reforms over the years aimed at harmonizing the retirement benefits of public and private sector workers and addressing sustainability concerns.

The earliest legislation was the 1976 Kıbrıs Türk Sosyal Sigortalar Yasası (Law 16/1976), which catered to self-employed individuals and private sector employees. This was followed by the 1977

Emeklilik Müessesesi Yasası (Law 26/1977) for civil servants, and the 1987 Emeklilik Yasası (Law 39/1987), which established the Emekli Sandığı Fonu, a fund for civil servants.

Historically, the pension system in North Cyprus has faced sustainability issues. The Social Insurance Fund, established in 1977, was in surplus until the late 1990s. However, the state often did not pay its contributions, leading to a depletion of reserves and growing deficits. By 2006, the pension deficit stood at 7.27% of gross domestic product (GDP), partly due to early retirements under lenient conditions and the failure of the state to contribute its share (Cevik, 2008).

North Cyprus's pension system, before these reforms, faced numerous challenges characterized by fiscal imbalances and inequities. Altiok and Jenkins (2013a) highlight the structural inefficiencies and the growing fiscal burden of the civil service pension scheme. The scheme, largely unfunded, was plagued by issues such as early retirement, generous benefits, and lack of actuarial fairness, leading to a significant strain on public finances.

Altiok and Jenkins (2015) discuss the broader context of the Social Security Pension System, emphasizing the disparities in benefits and contributions across different sectors. Their study suggests that before the reform, the structure of the laws and regulations governing the operation of the Social Security Pension System was marred by a lack of innovation and fiscal prudence, leading to social inequity and financial unsustainability.

A pivotal moment came with the 2008 Sosyal Güvenlik Yasası (Law 73/2007), applicable to civil servants and private sector employees hired after January 1, 2008. This law marked a significant shift by equalizing the contributions of the two sectors to the Social Security Pension System. Under the new system, all new employees after this date, regardless of whether they were in the public or private sector, are required to contribute the same percentage of their salary toward the total social security system (pensions plus other benefits), set at 9%. Employers contribute 11% and by law the government has to contribute 6% of the employee's declared income to the social security system. This reform also introduced a minimum working period of 25 years to gain full pension rights and aimed to align with EU norms. In addition, employees and employers must each contribute 4% of the employee's declared income to the Provident Fund.

The 2008 reform was a critical juncture in the history of North Cyprus's pension system, as extensively detailed in Altiok and Jenkins (2018). Their study provides a comprehensive overview

of the reform, which aimed to address the system's fiscal and demographic challenges. Key aspects of the reform included raising the retirement age and changing the benefit formula so that it cannot be manipulated while accounting for inflation. They note that the reform brought about fiscal savings and enhanced the sustainability of the pension system. The change in the retirement age and the benefit formula were particularly effective in reducing the system's long-term liabilities. Moreover, these changes were instrumental in aligning the pension system more closely with international standards and practices.

Altıok and Jenkins (2013b) delve into the post-reform scenario, analyzing how the changes affected the generosity of the social security system. Their study finds that while the reform has indeed reduced some of the system's generosity, it has also brought about a more equitable and sustainable framework. The article emphasizes the need for ongoing adjustments to ensure the system's responsiveness to demographic and economic changes.

The 2012 amendment to the Sosyal Güvenlik Yasası included private sector employees who were employed before 2008 and were previously under the 1976 law. This amendment was part of ongoing efforts to address disparities and financial sustainability challenges in the pension system.

This reform was aimed at creating a more equitable and sustainable pension system in North Cyprus, reducing public sector pension benefits and aligning retirement ages and conditions across sectors.

Overall, the 2008 pension reform followed by the 2012 pension reform in North Cyprus were significant steps toward addressing the longstanding challenges of the pension system. The reform's focus on fiscal sustainability, equity, and alignment with international practices has improved the system's outlook. However, these reforms were not enough.

According to Altıok and Jenkins (2018), after the 2012 pension reform in North Cyprus, significant challenges remained. The reforms did not fully resolve the fiscal sustainability issues; the pension systems continued to create large liabilities relative to GDP. Contributions over a worker's lifetime remained insufficient to cover the promised pension benefits, indicating an ongoing imbalance. Future reforms are crucial to ensure the long-term financial health and sustainability of the pension systems in North Cyprus.

2. Two Aspects of the Problem

When examining the financial situation with regard to the Social Security Pension System we need to consider two aspects of the problem. First, there is the immediate budgetary challenge of raising the funds from current contributors in any given year to meet the financial obligations to the current pension recipients. These individuals were promised certain amounts of income after retirement, which the government has an obligation to pay. The second aspect of the analysis is to investigate whether the structure of the pension system is designed so that over the lifetime of the participants, their contributions while they were working, if they were invested and earned interest, would be sufficient to cover the costs of the payout of the pension benefits after retirement.

The first dimension of the problem facing a pay-as-you-go social security pension system is affected greatly by the rate of contributions and, perhaps more importantly, by the demographics of the population. A central factor is how many workers are contributing compared with the number of eligible retired pensioners. The second dimension is one of fairness. To what degree are participants in the system, while working, contributing as much as they expect to take out as pension benefits when retired? Is the structure of the system designed to require a subsidy from the general taxpaying population to cover the costs of the pension promises made by the legal structure of the system? These two dimensions will be examined in turn in the remainder of this article.

2.1. Current Funding Challenge of Social Security Pensions

The pension system in North Cyprus is exhibiting signs of considerable fiscal strain, as evidenced by the data presented in Table 1 for 2010 through 2022. The fundamental issue lies in the disparity between the pensions paid out and the contributions received from the working population. Contributions to fund social security pensions constitute 5.5% from the employee and 7% from the employer of the employee's declared income, a total of 12.5% of the workers' earnings. However, an alarming trend has been observed: on average, 52% of the current pension payments to retirees are not financed through these contributions, resulting in a persistent deficit that necessitates financing from the general budget.

This systemic shortfall is indicative of a deep-rooted structural problem within the pension scheme. The design, which operates on a payroll system, is predicated on the principle that current workers' contributions will finance retirees' pensions. The implication of this pattern of deficits is twofold:

not only does it reflect the increasing burden on the state's fiscal resources, but it also raises concerns about the long-term sustainability of the pension system as it stands.

The annual average deficit of 52% is a stark indicator of the pension system's reliance on the general budget for solvency. Such a dependency underscores the urgency for a comprehensive reform of the pension framework. The current trajectory suggests an unsustainable fiscal path, with half of the pension obligations being met not through the intended contributory mechanism but through alternative state funding. This reliance on the general budget for pension funding is crowding out other critical expenditures, such as public sector support for health care and income support for the unemployed and elderly poor.

The disparities between current contributions and current pension payments were acute throughout the whole period from 2010 to 2022, as reported in Table 1. In 2022 total contributions amounted to 2.3 billion TL, against the total pensions paid out, which amounted to 4.6 billion TL. The deficit, amounting to 2.2 billion TL, or 49% of the total pension payments in that year, illustrates the magnitude of the imbalance. In the same year, the total budget for education was about 4.5 billion TL. It is also worth mentioning that this deficit figure represents the burden on the budget resulting solely from the Social Security Pension System. Taken together with the deficit of the civil servant pension system, which no longer accepts new entrants and which is financed almost entirely from the general budget, the severity of the pension problem becomes more obvious.

Table 1. Disparity Between Pension Contributions and Payouts in North Cyprus (TL) (2010–2022)

Years	Pensions Paid	Contributions (12.5%)	Difference (Deficit)	Difference (Deficit) %
2010	514,818,380	243,701,427	271,116,953	53%
2011	552,667,375	255,240,331	297,427,044	54%
2012	575,681,754	266,145,377	309,536,377	54%
2013	643,822,601	292,899,527	350,923,074	55%
2014	739,943,618	334,836,464	405,107,154	55%
2015	809,329,986	374,342,611	434,987,375	54%
2016	899,604,775	428,225,728	471,379,047	52%
2017	1,055,016,186	530,285,730	524,730,456	50%
2018	1,283,915,715	656,773,817	627,141,898	49%
2019	1,721,818,629	876,230,133	845,588,496	49%
2020	1,975,967,555	899,250,788	1,076,716,767	54%
2021	2,400,909,581	1,113,869,041	1,287,040,540	54%
2022	4,554,102,845	2,323,546,041	2,230,556,804	49%
Average				52%

The average support ratio, which measures the number of workers contributing to the pension of one retiree, was 3.54 between 2010 and 2022, underpinning the demographic challenge of a working population required to support a retiree cohort. If the contribution rate (CR) is not increased, the current support ratio of 3.62 would need to increase to 7.10, necessitating a rise in the number of contributors from 161,868 to 317,258, a surge of 1.99 times the current figures, to achieve a zero-deficit scenario.

To achieve a zero-deficit scenario without increasing the CR, a large influx of young immigrant workers who are registered in the social security system would be crucial in the short run. This would entail not only expanding the workforce but also ensuring that these new entrants are integrated into the formal economy.

Moreover, it is imperative to ensure that all working individuals, both native and immigrant, are duly registered and actively contributing to the pension system. The unregistered or informal employment sector poses a significant challenge in this regard, as individuals in this sector do not contribute to the pension fund. Strengthening labor market regulations and enhancing enforcement are critical steps in this direction. These measures would not only increase the number of contributors but may also, if coupled with a number of structural reforms, ensure the sustainability of pension payouts.

The years 2020 and 2021, notably, were during the Covid-19 pandemic, a period characterized by elevated unemployment rates and economic downturns globally. During this time, many sectors faced lockdowns and reduced operations, leading to a decline in employment and, consequently, in pension contributions. This reduction in contributions exacerbated the pension system's deficits. As the workforce shrunk and earnings dwindled, the financial strain on the pension system intensified, resulting in the notable deficit observed in 2021. By 2022, the level of employment had largely recovered, and the level of the deficit fell to 49%, which was less than the 13-year average of 52%. This situation underscores the vulnerability of pension systems to macroeconomic shocks, particularly those affecting employment.

Another public sector administered institution designed to promote the cumulation of individual savings for retirement is the national Provident Fund. It is modeled as a defined contribution pension scheme that is managed by the government. It pays out a lump sum to the participant when the person reaches retirement age. Only employees and their employers are required by law to

contribute to the Provident Fund. The self-employed are required to contribute to the social security fund at a rate of 18.5% of their declared earnings, but it is optional for them to contribute to the Provident Fund. Any contributions to the Provident Fund would be tax deductible for income tax purposes and the proceeds could be withdrawn later free of income tax. Despite the very generous tax treatment, not a single contribution has been made by the self-employed to the Provident Fund for many years. Given that the tax treatment is more generous than that received by the 401(k) pension plans in the USA or the RRSP pension plans in Canada, the empirical evidence of nobody being willing to contribute voluntarily to the Provident Fund is a testament to the disaster that it is as an investment instrument for financing retirement.

Table 2 presents a comparative analysis of investment returns in the Provident Fund against other inflation-protected investments over a period of 14 years (2010–2023). It showcases how the value of a series of annual cumulations of the Provident Fund with its government-set interest rates compares after 13 years with the situation if these contributions had been invested in an inflation-indexed account earning a zero real interest rate and with an inflation-indexed account earning a real interest rate of 3%.

In this simulation, an annual contribution is made each year to the Provident Fund from 2010 to 2022. This contribution is set at 100 TL in 2010 and the amount contributed is then increased with the annual rate of inflation each year until 2022. Column 3, ‘Annual PF contributions,’ reflects these yearly contributions.

The second column in Table 2 represents the Provident Fund interest rate in North Cyprus, serving as an indicator of the potential growth of retirement savings. The fourth column shows the cumulative values of the Provident Fund over time by investing 100 TL annually into the fund. By 2023, this investment accumulates to 6,397.20 TL, a stark contrast to the cumulative value of the other two benchmarks used for evaluating the relative investment performance.

Table 2. Comparative Analysis of Provident Fund Returns in North Cyprus (TL) vs. Inflation-Adjusted Investments (2010–2022)

	1	2	3	4	5	6
Years	Annual Inflation Rate	PF Interest Rate	Annual PF contributions	PF Cumulative Value	Total Value invested in PF adjusted for inflation	Total Value invested in PF adjusted for 'inflation+3%'
2010	3.27%	12.20%	100.00	100.00	100.00	100.00
2011	14.72%	9.00%	103.27	215.47	206.54	209.64
2012	3.60%	9.00%	118.47	353.33	355.41	366.18
2013	10.22%	9.00%	122.74	507.87	490.95	513.48
2014	6.49%	9.00%	135.28	688.86	676.40	718.22
2015	7.78%	9.00%	144.06	894.92	864.36	931.84
2016	10.19%	10.00%	155.27	1,130.72	1,086.87	1,189.73
2017	14.68%	10.00%	171.09	1,414.89	1,368.71	1,521.38
2018	29.96%	13.08%	196.21	1,752.58	1,765.85	1,993.27
2019	11.66%	19.00%	254.99	2,236.81	2,549.88	2,923.15
2020	15.03%	10.08%	284.72	2,946.52	3,131.92	3,646.63
2021	46.09%	16.33%	327.51	3,571.04	3,930.16	4,648.08
2022	94.51%	18.00%	478.46	4,632.66	6,220.03	7,472.55
2023			930.66	6,397.20	13,029.25	15,901.56
Relative to PF in 2022					0.74	0.62
Relative to PF in 2023					0.49	0.40

Note: PF indicates Provident Fund.

Column 5 serves as a baseline for understanding the real return on investments. If the annual contributions of 100 TL per year starting in 2010 were adjusted annually only for inflation, the cumulated amount would have grown to 13,029.25 TL by 2023.

The real value of the cumulated Provident Fund balance in 2023 for an individual at the end of this period is only 49% of the value of the cumulated contributions made by an employee over the 13-year period if the balance in the fund were each year adjusted for the inflation in that year. Because the balances in the Provident Fund are denominated in TL, the periodic episodes of high inflation experienced by Turkey and North Cyprus erode the real value of the fund's balances held by individuals.

The situation is much worse if the alternative asset being held to finance retirement earned a real rate of return of 3% above the rate of inflation. For example, Turkish government-issued bonds denominated in \$US during this period have yielded a real rate of return of more than 3%. The same has been the experience of those individuals who had purchased land in North Cyprus during

this period. Such alternative assets earning a real rate of return of 3% would have a cumulative value of 15,901.56 TL, while the cumulative value of the funds invested into the Provident Fund would have yielded only 40% of this amount (Table 2, column 6).

In North Cyprus there are many small plots of land and apartments, which people buy as an asset to provide protection against the erosion of the value of their savings by inflation. Given the increased attractiveness of North Cyprus as a place for people to purchase holiday homes, such investments in land have proven to be a very high-return investment. In contrast, investments in the Provident Fund have yielded only negative real returns.

It is clear from the above analysis that the Provident Fund is a public institution that in its present form should be abolished. It serves primarily as an instrument to allow the government, through the effects of inflation, to erode the pensions savings of employees. The contributions to the Provident Fund have been largely borrowed by the government at negative real interest rates and not paid back. This method of investing through the Provident Fund comes at a cost to the retiring participants of the scheme.

It is not surprising that the self-employed completely avoid contributing to the Provident Fund. This analysis, however, provides some clues as to the direction that reforms of both the Social Security Pension System and the Provident Fund might take to create a single sustainable public pension system in North Cyprus.

Table 3 reports on an extended analysis of the existing and alternative contribution strategies for financing the Social Security Pension System in North Cyprus. To understand their impact on the pension fund deficit, a simulation is made using the actual pension benefits and contributions from 2010 to 2022 as the basis for the analysis. This table utilizes basic information from Table 1, focusing on the pension deficits that would have existed under different CR.

Table 3, column 1, reports on the annual deficits as a percentage of the total pension benefits paid out over the year. Over the 12-year period, the pension system consistently operated at a deficit, ranging from 49% to 55% under the standard 12.5% CR. This indicates a persistent gap between the funds required to sustain pension payouts and the contributions received. Except for the Covid years, 2021 and 2022, there was a slight reduction in the deficit after 2016. This is because of the

reduction in average pension benefits received per recipient as the proportion of the population of retirees with pensions determined by the new formula increased.

Table 3. Contribution Rates vs. Pension Deficits: A 12-Year Analysis in North Cyprus

Pension Contribution As Percent of Gross Earnings	<u>12.5%</u>	<u>20.0%</u>	<u>25%</u>	<u>26.0%</u>
Years	1	2	3	4
2010	53%	24%	5%	2%
2011	54%	26%	8%	4%
2012	54%	26%	8%	4%
2013	55%	27%	9%	5%
2014	55%	28%	9%	6%
2015	54%	26%	7%	4%
2016	52%	24%	5%	1%
2017	50%	20%	-1%	-5%
2018	49%	18%	-2%	-6%
2019	49%	19%	-2%	-6%
2020	54%	27%	9%	5%
2021	54%	26%	7%	4%
2022	49%	18%	-2%	-6%
Average	52%	24%	4.68%	1%

In Table 3, column 2, the entire 20% social security contribution (9% from the employee and 11% from the employer for all the social security programs) is assumed to be allocated to financing the pension component of social security. This, in fact, has been the way the government has been financing a major part of the social security pension benefits for some years. Even when all the 20% contributions that employees and employers make to the social security system are applied to finance the pensions, the average deficit is still equal to 24% of the benefit payments made over this period (Table 3, column 2).

As a result of the diversion of funding from the public health care system, the ability of the public sector health system to meet the demand for such services from the residents of North Cyprus has been significantly eroded. In response to this gap between the demand and the public supply of health services, a much better-quality private health care system has developed, largely through an increase in the number of private hospitals and clinics. These private hospitals, which are of

varying quality, operate on a fee-for-service basis. Only poor individuals and households depend primarily on the public health care system for health services.

The data further demonstrate a troubling trend: even with a hypothetical allocation of the full 20% contribution toward pensions, there would still exist a deficit, albeit a reduced one. This persistent deficit, while smaller, continues to highlight the inadequacies of the current funding model. The sustainability of the Social Security Pension System is not guaranteed with such ad hoc financing.

Some stakeholders have argued that a perceived deficit is mitigated when considering the government's legislated obligation to contribute an additional 6% toward pensions. This viewpoint is represented in Table 3, column 4, which suggests that when the 20% CR by participants is augmented by a 6% government contribution, the average deficit ostensibly reduces from 52% to 1%. This interpretation warrants a critical examination. The additional 6% government contribution, although legislated, effectively represents a transfer from general taxation to the pension system, thus still constituting a fiscal burden on the state's budget. The characterization of this transfer as a 'contribution' masks the underlying issue of the pension system's inability to be self-sustaining. The additional funding required from the government to balance the pension system's books is symptomatic of an operational deficit. Furthermore, the effect of the government's 6% support comes after the 7.5% tax for funding the health system and other social security items such as unemployment insurance had been entirely transferred to fund the pensions of retirees.

It is imperative to acknowledge the true financial state of the pension system, which requires a reform that addresses both its structural deficits and its long-term viability without relying on external government contributions that may mask the system's financial health. The importance of the public Social Security Pension System in providing income support to retirees in such an inflationary environment cannot be overemphasized. It is critical that the funding of this system be properly institutionalized in a way that is transparent and sustainable for future generations of retirees.

To mitigate the current social security budgetary issues, we also propose that the Provident Fund be reformed and merged with the Social Security Pension System. Currently, employees must contribute 4% of their gross-of-tax incomes and this is matched by a 4% contribution by the employer to an account that is administered by the government. All contributions to the Provident

Fund are tax deductible. When the employee reaches the age of 55, they are eligible to withdraw the funds they have contributed, plus interest earnings that are determined periodically by the government. All withdrawals are made free of any income tax. As we have shown above, the beneficiaries of the savings of employees who are forced to contribute to this fund are not the future retirees but the government, which has been borrowing from the Provident Fund at rates of interest that do not compensate for even the rate of inflation. This proposal is to stop any new contributions being made to the existing Provident Fund accounts of individuals, although the funds already invested in the accounts can be withdrawn in the future, according to the fund's current rules.

A possible way to fund the Social Security Pension System is to increase to 25% the combined rate of employees' and employers' contributions and those of the self-employed to the social security system. The results presented in Table 3, column 3, suggest that this rate could potentially eliminate the pension system's deficit. This outcome is likely, as the deficit has been falling slightly since 2015 (except for the Covid years) due to the application of the new pension formulas to new retirees.

The current combined rate of contributions to the Social Security Pension System and the Provident Fund of 28% can be restructured in three different ways to enhance the system's sustainability.

1. Increase pension contributions from 12.5% to 25% of gross employee income and eliminate the current 8% required contributions to the Provident Fund. By increasing the pension contributions to 25% of gross income, the sustainability of the Social Security Pension System's financial health is guaranteed (Table 3, column 3). This approach focuses solely on enhancing the primary source of pension funding.
2. Integrate unemployment insurance and the Social Security Pension System (total CR of 28%). Here, we propose increasing pension contributions to 25% of gross income and adding a 3% premium for unemployment insurance, totaling 28%. This unemployment insurance provides additional security, helping maintain stability for employees during periods of joblessness and contributing to the overall resilience of the social security system.

3. Increase Social Security Pension System contributions while placing 3% of contributions into a reformed Provident Fund that only invests in hard currency assets (total 28%).

Another alternative is to increase the pension contributions to 25% of gross income, plus a 3% Provident Fund contribution. The Provident Fund would then be invested in hard currency financial assets that are denominated in dollars or euros. This strategy hedges against local currency devaluation and inflation, ensuring more stable and potentially higher returns for the fund.

In all these scenarios, while there is an increase in total contributions to the Social Security Pension System, the overall income deductions for the contributions made toward retirement either remain the same or are reduced. These reforms aim to guarantee the solvency and sustainability of the Social Security Pension System without reducing the take-home pay of employees. Each approach offers a unique solution to the pension system's challenges, focusing on bolstering funding through increased social security pension contributions while providing additional financial security measures or more strategic investment options.

All these proposals imply a uniform CR for all, including the self-employed, who currently pay 18.5% without the Provident Fund. This increase aims to bolster government revenue, even if the Provident Fund component is dissolved, by enhancing social security contributions to a flat rate of 25%, thereby restructuring the pension system to better withstand inflationary pressures and provide more substantial retirement benefits.

According to the Organisation for Economic Co-operation and Development (OECD) (2021), in 34 member nations of the OECD, participation in pension schemes is compulsory, encompassing both the public and private sectors. These countries typically feature pension systems where contributions are more directly linked to the pension system. Within this cohort, 11 nations—Austria, Czechia, Denmark, Finland, Germany, Iceland, Italy, Lithuania, Luxembourg, Slovenia, and Turkey—extend their pension contributions to cover disability or invalidity benefits. As of 2020, the average effective CR for pensions at the average income level in these countries was 18.2%. Italy has the distinction of having the highest mandatory CR, at 33%. Other countries with notably high CR, between approximately 26% and 28%, include Czechia, France, and Greece.

To compare the deficits in North Cyprus and other countries, it is worth mentioning that the pension systems in some European countries are also facing significant financial challenges, as highlighted

by Hervé and Monika (2023) and Gillet and Vasse (2024). In France, pension spending constitutes approximately 14% of GDP and the current deficit in the pension system is 2% of GDP. In North Cyprus, social security pension spending alone (excluding civil service pension) is around 6.2% of GDP and the pension deficit being financed by the government is now 3.02% of GDP. This provides an indication of the relative imbalance between current pension payments and contributions in the Social Security Pension System in North Cyprus relative to EU countries.

The other major components of the social security system are the publicly supplied health services and the income support to individuals with very low incomes or disabilities. It would be more equitable to have such current expenditures financed out of the value added tax system, which has a much broader base as it is applied to the current consumption expenditures of the residents of the country rather than simply the wages and incomes of employees and the self-employed.

Some World Bank publications provide a comprehensive view of the complexities and distinctions between health care financing and pension systems. They can be instrumental in supporting the argument that health care should be financed independently of social security or pension contributions.

Several studies have addressed the problems with the financing of health care through social security or pension contributions. The World Bank (2014) emphasizes the importance of how countries finance health care and its impact on the performance and outcomes of health systems. It discusses different methods of mobilizing revenues for health care and the role of public and private insurance in health financing. The World Bank's interventions in health financing across various countries are outlined, highlighting the complexity of health financing and its separation from other social welfare mechanisms such as pensions.

Holzmann (2012) addresses the changing dynamics of global pension systems and their reforms, driven by various factors including economic crises and demographic changes. The focus here is on the pension systems themselves, with discussions on reforms across different pension pillars. It provides a context for understanding how pension systems are distinct entities that face unique challenges, separate from health care financing. Dorfman and Palacios (2012) review the World Bank's framework for analyzing pension programs, focusing on challenges such as coverage, adequacy, and sustainability. They highlight the distinct objectives and challenges of pension systems, reinforcing the idea that health care financing might require a different approach.

In numerous US states, policymakers have actively tried to diminish the liabilities associated with public pensions and retiree health benefits, driven by substantial underfunding issues. These alterations have the potential to impact decisions regarding social security claims and workforce participation by modifying the benefits gained from continued employment. Ni and Podgursky (2016) and Salinas (2017) are examples of studies that have utilized administrative records from particular states that have undergone modifications in retirement or health care benefits. These studies specifically investigate how such changes influence employment trends in the public sector.

2.2. Long-term Structural Fairness of the Social Security Pension System

The second dimension of the Social Security Pension System is its long-term fairness. The central question is whether the recipients of the pension system have paid enough into the system in the contributory phase when they were working to warrant the amount of pension benefits they are receiving.

To conduct this analysis, one needs to employ an actuarial model of the pension system that can be used to evaluate the impact of the different variables and parameter values used in the design of the pension system. Such a model is discussed briefly below.

2.2.1. The model

In this analysis, we have used the actuarial model developed by Altiok and Jenkins (2015) for evaluating the Social Security Pension System of North Cyprus. This is a sophisticated tool designed to assess the financial sustainability and social equity of the system. The model, which is pivotal in estimating the net cost of the pension system, intricately incorporates various parameters to simulate and project the outcomes of different pension scenarios. The model's inputs are multidimensional, encompassing demographic, economic, and policy-related data:

1. **Demographic Data:** This includes age, gender, life expectancy, and mortality rates of the pension system participants. These factors are crucial for estimating the duration and amount of pension payments.
2. **Economic Parameters:** Key economic inputs include wage growth rates, inflation rates, and the rate of return on pension fund investments. These parameters help in projecting the future value of pension contributions and benefits.

3. Pension System Parameters: These involve the rules and formulas used to calculate pensions, such as the replacement rate (RR), retirement age, and years of service. The model also considers the wage history of individuals and the relation between individual wages and the average wage in the workforce.

4. Policy Scenarios: The model can simulate various policy reform scenarios, such as changes in CR, pension formulas determining the income RR of the ultimate pension benefits, and eligibility criteria.

The outputs of the model are designed to provide a comprehensive understanding of the pension system's viability:

1. Present Value of Pension Contributions and Benefits: The model calculates the present value (PV) of the lifetime pension contributions and benefits for individuals, considering various factors such as wage growth and life expectancy.

2. Deficit/Surplus Estimates: The model estimates the potential deficit or surplus in the pension system under different scenarios, providing insights into its long-term sustainability.

3. Impact of Demographic Changes: The model assesses how demographic shifts, such as an aging population, impact the pension system's financial health.

4. Effectiveness of Pension Reforms: The model evaluates the impact of potential reforms on the system's solvency and equity.

5. Gender- and Age-related Outcomes: The model provides insights into how different pension policies might affect various groups differently, such as men vs. women or younger vs. older workers.

Overall, the actuarial model by Altiok and Jenkins (2015) stands as a comprehensive tool for analyzing the Social Security Pension System in North Cyprus. Its ability to integrate diverse inputs and project critical outcomes makes it an invaluable resource for policymakers and researchers. For a more in-depth understanding of the model and its applications, the original paper by Altiok and Jenkins (2015) offers detailed insights and explanations.

2.2.2. The key features of North Cyprus's Social Security Pension System

The Social Security Pension System in North Cyprus, reformed in 2008 and refined in 2012, has several key features:

Benefit Formula: The actual monthly pension amount a retiree receives at the point of retirement is determined by multiplying the average wage declared in the country one year prior to retirement by the RR. The RR is calculated as follows: for the years of service up to a maximum of 15, it is 2.5% per year, and for each year beyond 15, it is an additional 2%.

Retirement Age: Previously, under the Civil Servants Pension Scheme and Social Insurance Scheme, retirement was possible at or even below the age of 50, with the average retirement age being 55 for both civil servants and private sector workers. The new Social Security Pension System has increased the retirement age for new entrants to a minimum of 60, which is a step toward sustainability, though it is still below the EU average of 64.3 for men and 63.5 for women (Yanatma, 2023).

Contribution Rate: The CR is 12.5% of the monthly gross salary for all new civil servants employed after 2012 and for all private sector employees.

Replacement Rate and Calculation of Pension Benefits: The 2008 reform partially addressed the issue of the generous RR of the Civil Servants Pension Scheme and the Social Insurance System applicable to private employees. For civil servants, the RR was 55.79% of the final year's income, while for social insurance for private sector workers, it was 70% of the highest four years out of the last seven years' income. This formula, which weighed the incomes of only the four best years of the last seven years of working, meant that the Social Insurance System was subject to manipulation and abuse.

The new system calculates pensionable income in an innovative way to prevent manipulation and to account for inflation. The declared incomes of a contributor are calculated annually relative to the average income of all contributors in that year throughout their working life. The overall average of these ratios, excluding the final year's income before retirement, is multiplied by an RR. This rate is formulated by multiplying the first 15 years of service by 2.5% and adding 2% for each additional year of service.

For the analysis in calculating the average RR or required CR, the sets of both male and female contributors are broken down into equal groups, each with an equal number of individuals. There

are those who retire at age 60 having contributed for 25 years, those who retire at age 60 having contributed for 30 years, and those who will retire at age 65 having contributed for 30 years.

2.2.3. Results

The pension system's gender dynamics and the impact of lifetime earnings on subsidies become evident when examining the PV of subsidies at retirement, excluding widows' payments. The results presented in Table 4 delineate scenarios based on different service years and retirement ages for both men and women.

For men with 25 years of service retiring at 60 (Table 4, column 1), the subsidy—a measure of the expected value of the pension system's payments upon the date of retirement relative to the PV of individual's contributions at this same point in time—ranges from a deficit of 45,011 EUR for someone declaring a minimum wage income during their contributory period to a subsidy of 315,075 EUR at a declared income of seven times the minimum wage. Women, on average, receive a higher subsidy, reflecting their longer life expectancy and, implicitly, the longer duration of pension payments. The average subsidy for men is 48% of the pension income they receive, while for women it is 53% (Table 4, columns 4 and 8). An average of these two rates of subsidy is very close to the current annual budgetary deficit being experienced by the pension accounts of the social security system.

Table 4. Gender Disparities and Pension Subsidies in North Cyprus (EUR, January 2023 price level)

	PV of Subsidy as of Year of Retirement							
	1	2	3	4	5	6	7	8
	M, 25, 60	M, 30, 60	M, 30, 65	Average	W, 25, 60	W, 30, 60	W, 30, 65	Average
X 1 MW	−45,011	−47,835	−34,453	−42,433	−49,779	−67,765	−41,342	−41,345
X 2 MW	−90,021	−95,670	−68,905	−84,865	−99,558	−135,530	−82,683	−105,924
X 3 MW	−135,032	−143,506	−103,358	−127,299	−149,337	−203,295	−124,025	−158,886
X 4 MW	−180,043	−191,341	−137,810	−169,731	−199,116	−271,059	−165,366	−211,847
X 7 MW	−315,075	−334,847	−241,168	−223,697	−348,454	−474,354	−289,391	−370,733
Average	54%	49%	41%	48%	57%	58%	45%	53%

Notes:

PV: Present value

The assumption underlying these calculations is notably conservative, as the system also provides widows' payments equivalent to approximately seven years of a deceased husband's working life—a benefit not reciprocated for widowers. This asymmetry in survivor benefits further widens the gender gap in pension subsidies.

This analysis reveals that the current Social Security Pension System in North Cyprus is characterized by significant subsidies that vary by gender and income level. The inherent gender disparities and the impact of lifetime earnings on pension benefits necessitate a critical review of the system to ensure equitable and sustainable pension provisions. The findings suggest that reforms aimed at addressing these inequities, possibly through a restructuring of contribution levels and a re-evaluation of benefit formulas, are imperative to maintain the system's financial viability while ensuring fairness across different demographics.

Importantly, the proximity of the current contribution deficit to the long-term deficit for individuals unveils a unique opportunity. This closeness suggests that some solutions might simultaneously address both the immediate fiscal challenges and the long-term sustainability issues. For example, a recalibrated CR that addresses the current shortfall could also be structured to align with the lifetime contributions required for sustainable long-term payouts. This dual-purpose approach would not only resolve the immediate financial strain but also lay the groundwork for a more equitable and enduring pension system. Such a strategy would require careful analysis to balance short-term fiscal needs with long-term actuarial fairness, ensuring that the system remains solvent and equitable for both current and future retirees.

Table 5. Contribution Rate Adjustments to Attain Fiscal Equilibrium in the Pension System

	Break-Even Contribution Rates (No Deficit)							
	1	2	3	4	5	6	7	8
	M, 25, 60	M, 30, 60	M, 30, 65	Average	W, 25, 60	W, 30, 60	W, 30, 65	Average
CR	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%
Break-Even CR	27.20%	24.50%	21.10%	24.30%	29.80%	29.50%	22.90%	27.40%
Actual RR	57.50%	67.50%	67.50%	64.20%	57.50%	67.50%	67.50%	64.20%
Break-Even ARR	26.40%	34.40%	39.90%	33.60%	24.20%	28.60%	36.90%	29.90%

Note:

CR: Contribution rate

RR: Replacement rate

An examination of the break-even CR necessary to eliminate the pension deficit reveals a stark contrast between the current and required rates to maintain sustainability. The standard CR of 12.5% falls significantly short of the break-even rate of 24.3% on average for males, which would be needed to maintain the system without a deficit over the long term (see Table 5). This rate of 24.3% is very close to the rate of 25% of the reform being proposed as a way to close the current budgetary funding gap for the system.

For a male with 30 years of service retiring at 60, the required CR to sustain the pension system without incurring a deficit would be 24.5%. Similarly, for a woman under the same conditions, the rate would be 29.5%. These rates suggest that an approximate doubling of the current contributions is needed to both stabilize the budgetary impact of the system and provide a basic level of long-term fairness in the system.

The actual current RR, which indicates the percentage of the average income (expressed in the price level at the time of retirement) that the pension would replace is currently 64.2% on average for males. To align the RR with the current CR of 12.5%, it would need to be drastically reduced to 33.6%. This would mean that retirees would receive only a third of their last year's income as a social security pension. According to the Government of Canada (n.d.) and the Editorial Team at Income.ca (2021), this is comparable to the RR of the Canadian pension plan (33%), which has approximately the same CR (11.9%) as the one levied in North Cyprus. In the case of Canada, the pension benefits accumulate at slightly more than 1% a year, while for North Cyprus the promised annual pension benefits cumulate at a rate of between 2% and 2.5% of the income earned in each year employed.

These findings point out the trade-offs that policymakers face. First, they can increase the CR to about 25% while eliminating the inefficient Provident Fund system. This would ensure pension stability without any net cost to the participants in the Social Security Pension System. However, the Ministry of Finance will need to find alternative sources of funding from those they now obtain by plundering the contributions of the participants of the Provident Fund. Second, the authorities could maintain the CR at 12.5%, which would necessitate a considerable reduction in pension benefits, at least over time. This second alternative would lead to public discontent.

It has often been suggested that the solution to the current budgetary deficits of the Social Security Pension System is to force private sector employees to declare a higher percentage of their

employment income to the social security system and hence increase current contributions. The analysis of this policy option underscores a systemic challenge: if wage declarations are being forced to increase, the immediate inflow of contributions improves the current state of the pension fund. However, this is a double-edged sword: while higher declared incomes would now yield higher contributions, this will lead to significantly larger pension obligations later, potentially creating an even more unsustainable systematic problem when these individuals retire.

In essence, the strategy of encouraging higher wage declarations to address the current underfunding of the pension system could inadvertently guarantee future financial instability. This paradox highlights the need for a strategic approach that balances immediate fiscal needs with long-term pension liabilities. The increase in short-term contributions based on increasing declared incomes may provide temporary relief, but could exacerbate the subsidy burden in the long run, especially as the population ages and more retirees draw on the system at higher subsidy levels.

The analysis of subsidies based on varying wage declarations reveals a crucial aspect of pension economics: the intergenerational transfer of fiscal responsibilities. Policymakers must consider the repercussions of today's contribution policies on tomorrow's pension payouts. A sustainable pension system requires not only adjustments to current contributions but also a forward-looking strategy that anticipates future demographic shifts and economic conditions.

3. Conclusion and Policy Implications

The pension system in North Cyprus faces significant challenges, which manifest in the form of structural deficits, gender disparities, and sustainability concerns. The analysis reveals that the system operates under a substantial fiscal strain, with an average subsidy of 50% for pensions, evidencing a mismatch between contributions and payouts. This subsidy is not uniformly distributed across different income groups, nor between genders, with women receiving an even higher rate of subsidization due to longer life expectancies.

A striking concern is the system's apparent lack of fairness and sustainability. Lower-income groups receive smaller subsidies in absolute euro terms, highlighting an inequitable burden distribution that may further entrench socio-economic disparities among the elderly population. The sustainability of the system is ostensibly maintained by the full utilization of employee and

employer contributions, which may detract from other social security benefits and reflect a short-term approach to a long-term problem.

The prevailing pension scheme in North Cyprus is at a crossroads. To move toward a more equitable and sustainable path, comprehensive reform is imperative. Such reform should be grounded in principles of fairness, financial viability, and long-term strategic planning. It must address the immediate fiscal imbalances and lay the groundwork for a pension system that is robust enough to withstand demographic changes, economic fluctuations, and the evolving needs of society.

The pension system's current trajectory is unsustainable and unjust. Without thoughtful intervention and reform, the pension scheme may become a source of increased public debt, social inequality, and economic inefficiency. It is incumbent upon policymakers, informed by the analysis herein, to enact reforms that will ensure the pension system is equitable, and sustainable for future generations.

The current state of the pension system in North Cyprus presents significant challenges that necessitate immediate and strategic policy interventions. The recommendations from the findings highlight the critical need for a sustainable and fair pension system that adequately protects contributors and retirees against inflation.

By directing all current social security contributions, plus 5 percentage points of the rate of Provident Fund contributions, toward social security pension funding, a more balanced and sustainable financial model can be achieved. This approach not only addresses the immediate concern of funding current pension payments but also ensures a fairer distribution of financial burdens and benefits across generations. By equating the PV of contributions with the PV of pension payouts, this strategy offers a more equitable system where individuals' contributions are more closely aligned with their eventual pension benefits. Such a reform would significantly reduce the pension deficit, moving the system toward a state of financial equilibrium and sustainability.

Reform of the Provident Fund: Given the erosion of the Provident Fund's value due to inflation, the recommendation is to eliminate the Provident Fund. This would enable individuals to decide how to save for their future, potentially through more reliable and profitable options.

Redistribution of Government Contributions: The government contribution and subsidies currently given to the pension system should be redirected toward the health sector and the vulnerable poor. This redirection is crucial, given that contributions are not sufficiently supporting health services, which are increasingly moving toward privatization.

These policy implications suggest a multifaceted approach that combines financial sustainability, social equity, and administrative efficiency to revamp the pension system in North Cyprus. The recommended strategies aim to enhance the system's resilience against economic fluctuations, address demographic challenges, and ensure that the pension system remains a reliable pillar of social security for future generations.

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