

Social Security Generosity, Budgetary Deficits and Reforms in North Cyprus

by

HASAN U. ALTIOK

Eastern Mediterranean University, North Cyprus
(e-mail: hasanulasaltio@gmail.com)

GLENN P. JENKINS

Eastern Mediterranean University, North Cyprus
Queen's University, Canada
(e-mail: jenkins@econ.queensu.ca)

Development Discussion Paper: 2012-1

Abstract

This paper estimates the fiscal burden of the Pay-As-You-Go (PAYGO) Social Insurance Pension System that was closed in 2008 to new members, and analyzes the appropriateness of the 2008 reforms that introduced the new Social Security Pension System in the TRNC. To calculate the overall deficit, estimates are made from the difference between the present values of future contributions and the pension benefits. The magnitude of the unfunded cost makes any marginal policy reform ineffective in eliminating the excessive fiscal burden on the current and future taxpayers for the next three decades. Major structural reforms will be required.

JEL classification: H55, H68

Keywords: pay-as-you-go, social insurance, social security, pension liabilities, implicit pension debt, pension indexing

Social Security Generosity, Budgetary Deficits and Reforms in North Cyprus

1. Introduction

A pension plan is an arrangement that is designed to provide working people with an income when they retire or are in need of income support¹ (IMF, 2011). Pensions have the characteristic for most people of being simply deferred compensation for work done earlier in life. For other people old age pensions can be viewed as a welfare scheme to provide individuals who are less fortunate with a basic level of income to enjoy a standard of living that the rest of society is willing to pay for. Most developed countries have well developed old age support systems to supplement pension systems that are based on work experience. According to IMF (2011), “more than three-fourths of public pension systems link benefits to earnings during working lives” (p.8). These pension systems can be classified according to the rules they have to determine with how the benefits of the pension are defined at the point of retirement: defined-benefit (DB) and defined-contribution (DC). Almost all the public sector pensions in Europe are of a defined-benefit nature (Grech, 2010).

When these plans are in fiscal equilibrium, the funding is expected to come from two sources: individuals’ own contributions during working years plus the capital market return on these funds (defined-contribution funded plans) or contributions of the currently working people that are used to pay the benefits of the retirees (defined-benefit pay-as-you-go unfunded plans). Being a PAYGO or funded pension system is one of the distinguishing features of pension plans. Most of the public pension plans operate on PAYGO basis where there is a contract between generations through payroll

¹This income support typically is in the form of old-age retirement pensions (about 75% of the cases), survivors pensions (about 10% of the cases) and disability pensions (about 15% of the time).

tax system. On the other hand, in the case of funded pension systems, which are mainly used in the emerging economies in Europe, Asia and Latin America either in the form of mandatory or voluntary basis, the contributors invest and later sell the accumulated assets to the succeeding generations to fund their retirement (IMF, 2011).

Until recently, wars and failure of capital markets have often resulted in the loss of private capital which stimulated the development of public sector supported pensions. The pay-as-you-go (PAYGO) pension plan is a very politically attractive option especially when the need for financial support of the elderly is immediate but the capital accumulation is not there and there is not sufficient time to accumulate for a funded pension. The era after the World War II is a good example of this period when the PAYGO systems were implemented throughout Europe.

Over the past 40 years pension spending has increased from 5% (1970) to 8.5% (2010) of GDP in advanced countries mainly due to high replacement rates, lower retirement ages accompanied by demographic changes that led to higher life expectancies after retirement and hence lower support ratios (IMF, 2011). Despite the reforms enacted over the past two decades that have helped to slow pension spending growth, pension expenditure is still the most significant budgetary item in almost all European countries. Owing to this fact, reforms including further increases in the retirement age, reduction in replacement rate and adjustments to pension benefit indexation have become major fiscal issues.

The Evolution of Social Security Pensions in North Cyprus

Turkish Republic of Northern Cyprus (TRNC) was established in 1983 after a war that only ended in 1974. After the war, two separate pension systems were developed, both on PAYGO basis, to be able

to fund the existing retirees. As part of a political strategy, the majority of the Turkish Cypriots were provided with public sector jobs with too generous pensions and very loose eligibility conditions under the Civil Service Pension System. The private sector jobs, on the other hand, were filled mainly with immigrants from Turkey who were later given citizenship with full pension rights. They along with the Turkish Cypriots who were employed by the municipalities or state enterprises increased the total number of pensioners under the Social Insurance Pension System (SIS). The generous public sector pensions stimulated an active sense of fairness (combined with Turkey's willingness to finance the budgetary deficits) that resulted in a very loose set of pension rules that made the TRNC social insurance system also paying out relatively large benefits for modest contributions.

The use of the Turkish Lira and the high and variable inflation rates of Turkey until recent years was another reason for the nature of the defined benefits formula that was built into the pension system. Any formula that did not put a heavy weight on the income of the final one or two years would result in an inadequate pension. The pension benefits in the TRNC were tied to the inflation-adjusted income right before retirement. Income before retirement as well as the pension benefits after retirement kept increasing not only just with the annual rate of inflation but also with the increase in real wage rates. In addition to these, Turkish Cypriots are now living longer compared with the period when the laws first passed. This has increased both the number of pensioners and the amount of pensions paid to them. All these structural problems have led to fiscal imbalances both in annual terms and in present value terms. In the past these fiscal shortfalls were financed by the aid from Turkey.

After 2003, the fiscal burden created by these pension plans was reduced somewhat as the fall in the rate of inflation was accompanied by an economic boom in the TRNC that produced an unexpected

increase in revenues. However, with the lowering of the rate of economic growth since 2007, and the efforts by the TRNC to become a full member of the EU, the generosity of the pension systems have become an important topic on the budgetary and policy agenda. A set of reforms in 2008 resulted in the formation of the Social Security Pension System (SSS) that applies to all new employees.

In a PAYGO system one of the critical aspects of the financial sustainability of the system is the number of contributors to the system at any given time relative to the number of retirees receiving benefits and the rate of their contributions. In the TRNC, an almost unique feature of the Social Security System going forward is the existence of a large pool of temporary workers from Turkey (approximately 90% men and 10% women) who contribute to the system but do not cost the system anything in terms of future pension benefits. This group is largely made up of workers employed on a contractual basis from Turkey who leave the island when their job is completed. These contributions are a significant amount of the present levels of such workers. However, in the future if the political and economic status of the TRNC were to change, the contributions of this group could increase substantially or be drastically reduced.

The aim of this paper is to evaluate the cost of the Social Insurance (SIS) and the reformed Social Security (SSS) pension systems in North Cyprus. Future taxpayers (in the TRNC and Turkey) along with the contributors of the SSS system will have to bear this cost. An assessment is carried out to evaluate the cost of the historical legacy of the social insurance scheme as well as the prospects for the future. Fortunately, we obtained access to each of the individual records of the Social Security systems so that the simulations can be carried out for 100% of the SIS and SSS participants. Such an assessment has been made for most of the countries of Europe, for example in a recent article Devesa-

Carpio and Devesa-Carpio (2010) have conducted a similar analysis of fiscal imbalance of PAYGO pensions in Spain.

2. The Structure of Social Security Pension Systems in North Cyprus

In North Cyprus, government sponsored pension system that is applicable to those working in private sector and to those working in the non-civil service component of the public sector is made up of two separate systems: the Social Insurance System (SIS) and the Social Security System (SSS). The former is operative under the Social Insurance Law of 1976 and covers only the workers employed prior to 2008. Palacios and Whitehouse (2006) in a World Bank report stated that the pension system was one of the largest drains on public finances in the northern part of Cyprus. As a consequence of this reality, the pension system was reformed in 2007. With the Social Security Law of 2007, a single pension system was established for both new civil servants of the public sector and new private sector workers hired after 2008. Those covered by the old scheme are still subject to the old system and receive their benefits accordingly. Both of these pension systems operate on a PAYGO basis and every year a considerable amount of financial contribution from the central budget is transferred to these schemes to finance their annual deficit.

In 2009, the government sponsored SIS included 62,184 total contributors and 25,414 pensioners yielding a support ratio of 2.45:1². According to the statistics obtained from the social security office, in addition to those who retired, on average each year 11,232³ workers have exited the system and never register again. In other words, this many people, almost all from Turkey, only contribute and

²The social security pension information (including individual contributions, declared income, age, sex and annual pensions if already retired) used in this study was obtained from the records of the Social Security Administration of the Turkish Republic of Northern Cyprus.

³ The average of the last ten years

never collect a pension from the system. The number of permanent workers who are expected to contribute and eventually receive benefits at retirement is therefore equal to $62,184 - 11,232 = 50,952$. The non-civil servant permanent contributors employed after 2008 are subject to the new law and are members of the SSS. The increase in the number of SSS participants is calculated as the sum of the number of SIS retirees each year and the number of people joining the system as a result of the increase in the labor force. In summary, the non-civil service permanent labor force in 2009 (that were participating in the social security system) is estimated to be made up of about 51,000 permanent members of the labor force and about 11,000 who are members of the labor force on a temporary basis. The size of the permanent labor force will change largely due to the change in the population of the permanent residents and the number of people who are retiring. However, the size of the temporary work force will depend on the demand for labor as investment and economic activity fluctuate.

Benefits Offered

Both the SIS and the SSS systems offer the same range of benefits. They cover work injury and occupational diseases, sickness, maternity, disabilities, unemployment, marriage, old-age pensions and survivor benefits (for widows).

This paper will focus on the old-age pension and survivor benefits. The former is provided in the form of monthly payments to those eligible workers using a corresponding replacement rate calculated on the basis of years of work and income. Another benefit within the scope of this paper is the pension benefits made to surviving widows.

Eligibility Requirements for a Full Pension

Under the SIS system, although the retirement age varies depending on the number of years of service, the empirical evidence reveals that the people on average retire after a minimum of 25 years of service and at about 55 years of age. With the new SSS law of 2007, these requirements were tightened and the retirement age was increased to a minimum age of 60.

Contribution Rates

Workers in this system contribute 8% of their gross salaries for their own pension plan and their employers are obliged to contribute an additional 10% to the workers' pension plan. Of this 18%, 11% is to finance the benefits of old-age, disability and survivors pensions. The remaining 7% is to finance other benefits such as health that are beyond the scope of this study. Workers under the SSS, contribute 12.5% of their gross salaries for the above-mentioned benefits. It is important to mention that in Europe the simple average rate of the contribution rates is 25% (European Commission 2007 and OECD 2005).

Replacement Rate for Old-age Pension Benefit

In North Cyprus, under the SIS system every eligible person receives an old-age pension based on a defined benefit formula that equals to an average replacement rate of 70% of the individual's last working month's salary⁴.

⁴The actual replacement rate of the pension benefit received by an individual is determined as a function of the number of years that a worker has contributed to the SIS, the best four years earnings out of the last seven years worked, and the ratio of these earnings to the maximum level of income on which social security contributions are paid. In most cases this complex formula works out to a net replacement rate of 70%. In order to check this number, we calculated the ratio of the average pension benefits received in 2009 by those retired in North Cyprus to the average annual declared wage in 2009 by the members of the labour force contributing to the Social Insurance Fund. We find this ratio to be 72%. Hence, in this study we use a replacement rate of 70% of the workers' last annual declared income to estimate the value of annual pension benefits at retirement in all subsequent estimations. It is important to state that for those declaring the minimum wage as monthly income; the replacement can be as high as 97.3% that is the minimum pension paid in the country, no matter how much income you declare, over the minimum wage.

Since pension benefits are not subject to income tax in North Cyprus, this rate is a net replacement rate (NRR). If the average tax rate of a pensioner is 20%, then a 70% net replacement rate is equal to a gross replacement rate (GRR) of 87.5%⁵. This is significantly higher than the 34 OECD countries' average gross pension replacement rate (for workers with average earnings) of 58.7% (OECD, 2007).

Survivors Benefits

According to SIS, widows receive 50% of the husband's full pension benefits after his death. The men can only get this benefit if he is over 60 years of age and fully dependent on his wife's pension benefit. That is not a common case in North Cyprus because the husbands are normally older than the wives. On the other hand, both male and female spouses under the new SSS can get the same level of survival benefits that equal to 50% of the deceased spouse's actual or anticipated pension.

From the life tables for Cyprus (World Health Organization, 2011) we learn that when evaluated at age 25 (the average age when men are hired into the civil service) Cypriot women are expected to live on average 4 years longer than men. In addition, historical cultural practices have resulted in wives being on average 5 years younger than their husbands. We have carried out an actuarial estimation of the value of this benefit, considering both the probabilities of the husbands dying each year after 25 years of age and that the wife (five years younger) is still surviving. In addition we consider the expected life of the wife as of that point in time. The value of this additional spousal survivor benefit that is assigned to every male is estimated to be equal to the normal annual pension received by male civil servants for

The SSS formula determining the monthly pension benefit is calculated as follows:

Average monthly declared lifetime income (adjusted for inflation) * Replacement rate, where the replacement rate is 2.5% per year of contributions for the first 15 years of work force employment plus 2% for every year of employment after the first 15 years of work.

⁵NRR = GRR * (1-t), GRR = NRR/(1-t), GRR = 70%/(1-20%) = **87.5%**

an additional 7 years beyond their expected life. The situation where a working woman dies prior to her husband is rare in North Cyprus, hence the spousal benefit attached to working women's pension has not been estimated.

3. Estimation of the Fiscal Burden of Social Insurance and Social Security Pension Systems

In this study, the annual net cost and the present value of the future costs are made for the period from 2009 to the date that the last person in the system is expected to die (based on the life tables) Then, the contributions of new permanent labor force and the new temporary labor force are subtracted from these costs to find the actual annual net cost and the present value of the future net costs until the new permanent entrants start retiring in 2045. Using the parameter values presented in Table 1 below for the base case, the fiscal burden of the SIS and the SSS is estimated and the sustainability of these systems after the 2008 reform is studied.

Table 1: Parameter Values for the Base Case Analysis (all 2009 figures)

Number of Permanent Workers TOTAL:	62,184-11,232=50,952
Women:	19,657-1,123=18,534
Men:	42,527-10,109=32,418
Number of Pensioners TOTAL:	25,410
Women:	11,320
Men:	14,090
Expected future annual growth rate of labor force	2%
Number of Temporary Workers	11,232 (last 10 years average)
Women:	1,123
Men:	10,109
Contribution Rate (prior to 2008)	11%
Contribution Rate (after 2008)	12.5%
Retirement age:	55
At 55, expected life expectancy:	25.9 for men, 29.3 for women
Replacement rate:	70%
Discount rate:	3%
Average number of years worked:	(Retirement Age – 25)
Widow compensation:	50% of the husband's last salary

Widow survivor benefit:	Equal to 7 additional years of husband's normal pension benefit.
Change in rate of contributions (base case):	0%
Growth rate in real value of pension benefits (base case):	0%
Growth rate of real wages (base case):	2%
Growth rate of GDP (base case):	4.61% (average of last 32 years)
Growth rate of Tax revenues (base case):	4.61% (same as GDP growth rate)
TL / EURO (2009):	1.94

Our analysis consists of four components. First, an estimation of the present value of the cost of the future pensions payments received by existing pensioners is made. Second, the net cost is estimated, in present value terms, of the pensions that will be paid to those currently working and contributing. The net fiscal burden of the latter component is the difference between the present value of the future contributions made by the people in the social security system minus the present value of the future pension benefits they are entitled to receive. Third, the contributions of the new permanent entrants are estimated annually and in present value terms. Fourth, the annual and present value contributions of the temporary workers that are in the TRNC at any point in time are estimated using different wage rates. These figures are then subtracted from the costs estimated in the first two parts to find the actual net costs.

To derive the cost of the future pension payments by those currently retired, the first task is to determine the number of years each person is expected to live, given their current age. This number is calculated individually for each of the 25,410 retired individuals. This number is derived from the life tables for Cyprus where the expected life of each individual (men and women separately) is estimated, given their current age. Subtracting the actual age of the individual from the expected life of the same individual gives us the number of additional years that this individual is expected to receive a pension. This variable is denoted as (n) in equation 1 below.

For those already retired, the estimation of the cost of future pension payments starts with the actual pension they received in 2009. This variable (P) is then increased each year until the expected year of death by the annual real rate of growth of pension (g_p) payments. Finally, each of the annual payments is discounted by the rate of discount (r) to 2009. The resulting present value is the cost, evaluated as of 2009, of the future pension payments received by each individual. To find the present value for the entire set of retirees the present values as of 2009 for each of the individuals are added together. This is expressed by the first term of equation 1.

The second term of equation 1 is to calculate the cost of pensions paid to widows after the death of their husbands. As discussed above, the value of the benefit is equivalent to 7 years of the normal pension received by the deceased spouse.

$$C_{EP} = \sum_{i=1}^{25,410} \sum_{t=1}^n \frac{P_i (1 + g_p)^n}{(1 + r)^n} + \sum_{s=1}^{14,090} \sum_{t=n}^{n+7} \frac{P_s (1 + g_p)^t}{(1 + r)^t} \quad (1)$$

where; P is the annual pension payment, n is the life expectancy after 2009, g_p the annual growth rate of pension benefits, r is the discount rate, i is the number pensioners, s is the number of married male pensioners and EP stands for the existing pensioners.

The second group of people for which the pension burden should be calculated is made up of those individuals who are still working for the private sector and are contributing to the Social Insurance Fund. The present value of fiscal burden created by the pensions that will be paid to those still working less the present value of their contributions from 2009 to retirement is calculated using equation 2.

$$C_{EC} = - \sum_{i=1}^{50,952} \sum_{t=1}^{R-A} \frac{cW_i (1 + g_w)^t}{(1 + r)^t} + \sum_{i=1}^{50,952} \sum_{t=R-A}^{(R-A)+n} \frac{MW_i (1 + g_w)^{R-A} (1 + g_p)^{t-(R-A)}}{(1 + r)^t} \\ + \sum_{u=1}^{32,418} \sum_{t=(R-A)+n}^{(R-A)+n+7} \frac{(MW_n (1 + g_w)^{R-A} (1 + g_p)^{t-(R-A)})}{(1 + r)^t} \quad (2)$$

where; n is the life expectancy after age of retirement, g_w is the annual real growth rate of wages, r is the discount rate, R is the retirement age, A is the current age in 2009, c is the contribution rate, W is the annual wages, u is the number of married male workers, M is the replacement rate and EC stands for the existing contributors.

To estimate this component of the cost of the pension system, we begin with the annual contributions made by each of the 50,952 individuals from 2009 until their retirement. The first term of equation 2 shows the summation of the discounted value of each private sector worker's annual wage times the corresponding contribution rate. The annual wage is increased by the expected growth in the real wage rates (g_w). The negative sign used for this part of the formula is because we need to subtract the present value of the contribution inflows from the pension benefits to be paid to each person after retirement. Secondly, the annual pension for each of the currently working employee is calculated using the replacement rate (M) times the expected real wage earned by the individual during the last year before retirement. This wage is estimated by taking the individual's wage rate in 2009 and adjusting it through time from 2009 until the year of retirement (R) by the expected real rate of growth of real wages (g_w). Once the individual retires, the annual pension benefit is then increased each year by the assumed real growth rate of pensions until each individual dies. When the present value of the estimated pension payments for each contributor is added up and then subtracted from the present value of the summation of each person's contribution, the net cost of the pension system for the currently working employees is calculated. Finally, the last term of the equation calculates the expected present value of the future payments to the widows who are expected to receive benefits after the death of the spouse using the same assumption as employed in equation 1. The present value of the cost obtained from this term is added to the net cost calculated from the first two parts to find the present value of the fiscal cost that will have to be borne the current level of pensions to existing workers.

The next component of our estimate is the contributions of the new permanent workers under the Social Security Law of 2007.

$$C_{NEP} = - \sum_{i=1}^l \sum_{t=1}^{R-A} \frac{cW_i(1+g_w)^t}{(1+r)^t} \quad (3)$$

where; g_w is the annual real growth rate of wages, r is the discount rate, R is the retirement age, A is the current age in 2009, c is the contribution rate, W is the annual wages, l is the number of permanent workers and NEP stands for the new permanent entrants.

These people enter the system as workers retire and the labor force grows. In this study, we assumed that the labor force grows at a rate of 2% annually. Our next assumption is that these new entrants will receive the average wage in 2009 adjusted for the annual growth in real wages at the time of employment and their annual income will grow by the growth in real wages plus the age-earnings premium rate for seniority assigned for each sex.

The econometric analysis we conducted show that the annual income of men and women increase by 2.33% and 1.55% respectively due to seniority⁶.

The last component in our study is the contributions of the temporary workers who will not receive benefits as they are not citizens and are expected to leave the country after a short period of work and contribution period.

$$C_{NET} = - \sum_{i=1}^k \sum_{t=1}^{R-A} \frac{cW_i(1+g_w)^t}{(1+r)^t} \quad (4)$$

⁶ In our econometric estimation of the age-earnings profile of the private sector labor force in North Cyprus we find that the growth in real wages per year for those employed from ages 20 to 55 attributable to age alone is 2.33% per year for men and 1.55% for women. In addition, in the base case we add a real increase of wages of 2% to these seniority factors. Hence, the members of the labor force in the SIS pension system can expect on average to earn 4.33% more each year if they are a man and 3.55% more each year if they are a woman.

where; g_w is the annual real growth rate of wages (excluding seniority premium), r is the discount rate, R is the retirement age, A is the current age in 2009, c is the contribution rate, W is the annual wages, k is the number of temporary workers and NET stands for the new temporary entrants⁷.

In the base case scenario, we assumed that the average number of temporary workers is 11,232 and this number will stay constant until 2045. Their annual income at employment is equal to the average annual income of the people contributing in 2009 adjusted for the growth rate in annual real wages. Seniority premium rates are not included in this calculation as the temporary workers are the young people who join the system for a short period of time and then are replaced again with young people.

4. The Results of the Analysis

Using the base case parameters presented in Table 1 above, we obtained the following results. There are two adjustments that we needed to make to the estimations using equations 1 to 3 as reported in Table 2, column 2. The first adjustment arises because not all of the workers will survive until the age of retirement. For these individuals, the pension system will have savings in the own pension benefits they would have claimed, but at the same time there will be a loss of contributions between the time of death and the date of normal retirement. Our estimate of the overstatement of the value of the pension deficits (based on the probabilities of a worker dying each year from age 25 to 55) for the base case ($g_w = 4.33\%$ and 3.55% , and $g_p = 0\%$, retirement age 55) is 2% of the values in Table 2, column 2, rows 2 and 3.

The second adjustment is required to reflect the fact that for the people who do live to the age of retirement they will not all live exactly to their average life expectancy (evaluated at the age of

⁷Temporary workers from Turkey who contribute to the Social Security system of the TRNC are allowed to convert these years into the years of service for the determination of pensions they receive upon retirement in Turkey. No money, however, is transferred from the TRNC Social Security system to the Social Security system of Turkey.

retirement) but there will be a distribution of ages of death with a mean equal to the expected age of death at retirement. Because future pension benefits are discounted, and also the real value of the pension benefits might be adjusted upward or downward over time then the present value of the pension benefits whose end periods are distributed over time will be different than the present value under the assumption that all deaths occur at exactly the expected age of death. With the base case assumptions the present value of the cost of the pension benefits for those who are retiring in the future (Table 2, column 2, rows 2 and 3) are overstated by a further 4.5%.

This means that we need to reduce the estimated cost of the pension benefits for contributors in Table 2, column 2, rows 2 and 3 by 6.5%, and the cost estimates for the currently retired individuals that are reported in Table 2, column 2, row 1 by 4.5%. These adjusted values are presented in Table 2, column 3.

To begin with, the adjusted present value of the net cash cost of the SIS system and the SSS system over the next 35 years is more than 10 billion euros (Table 2, row 5, column 3). This value expressed as a rate of GDP is equal to 392% (Table 2, row 7, column 3) of the GDP in 2009. The present value of the cost of financing the cost of the future pension payments made to the existing pensioners alone is estimated to be about 3.6 billion euros (Table 2, row 1, column 3). The net of the present value fiscal cost of the future pension benefits, less their future contributions for currently working individuals, in the SIS system, in present value terms is estimated to be equal to about 9.2 billion euros (Table 2, row 2, column 3). These figures clearly show the generosity of the SIS system in North Cyprus. This is mainly due to a 70% net replacement rate and insufficient contributions collected from both the existing contributors and new workers expected to join the system in future. Financial support to the

system comes from the contributions of new permanent and temporary workers and of course from the central budget.

Table 2: Present Value of the Components of the Deficit of the Pension System

		Without Adjustments	With Adjustments⁸
	1	2	3
1	PV cost of the existing pensioners (PVEP)	3,727,950,945	3,560,193,152
2	PV cost of the existing contributors (PVEC)	9,786,546,733	9,150,421,196
3	PV contributions of new permanent workers (PVCNPW)	2,072,954,373	1,938,212,339
4	PV contributions of temporary workers (PVCTW)	370,283,233	370,283,233
5	PV TOTAL COST (PVT)	11,071,260,071	10,402,118,775
6	PV cost per person in the system (PVPP)	144,984	136,221
7	PV TOTAL COST / GDP	417%	392%

Moving on to the present value of the contributions of permanent new entrants, it can be seen that the PAYGO system in North Cyprus is not designed effectively to finance the retirees' pension benefits from the contributions of those working. The present value of the contributions (until 2045, before an average-aged worker starts collecting benefits) of these workers is about 2 billion euros (Table 2, row 3, column 3). This can be compared to the present value of the net cost of those currently working of 9.2 billion euros (Table 2, row 2, column 3).

Another component of the financing comes from the temporary workers. 370 million euros in present value terms is a net inflow to the system as they do not draw benefits from this system in the future. With the rules of the SIS and the SSS, the SIS system's liability to each individual in the system (old and new members of the permanent labor force and the retirees) is equal to 136,221 euros (Table 2, row 6, column 3).

⁸The adjustments in the NPV's are made for the survivor's benefits arising from the death of the SIS member prior to retirement and for the distribution of the age of death around the values of the expected number of years of life. All figures in this paper are adjusted numbers.

5. Analysis of Policy Reform Options for Reducing the Level of Net Social Security Liabilities

The need for re-reforming the systems is apparent from the results presented in Table 2 above. Increasing the retirement age, decreasing the replacement rate, keeping the real wages of the contributors and the benefits received by the pensioners constant in real terms and raising the contribution rates can certainly help to improve the fiscal imbalances of these systems. Analyzing the reforms made in other parts of the world, we conducted various sensitivity analyses and estimated the impact of changes in the parameters presented as the base case in Table 1.

Sensitivity Analysis for Retirement Age

Our first policy tool is the increase in retirement age. At the moment, the retirement age on average is 55 although the law enables the eligible workers to retire at the age of 50. The average retirement age in OECD countries in 2009 was 63.5 for men and 62.3 for women (OECD, 2011).

Table 3: Sensitivity Analysis for Retirement Age

		1	2	3	4	5	6	7
		PVEC	PVEP	PVCNPW	PVCTW	PVT	PVPP	PVT/GDP
1	55	9,150,421,196	3,560,193,152	1,938,212,339	370,283,333	10,402,118,775	136,221	392%
2	60	8,531,907,062	3,560,193,152	1,938,212,339	370,283,333	9,783,604,642	128,121	368%
3	65	6,840,558,172	3,560,193,152	1,938,212,339	370,283,333	8,092,255,752	105,972	305%

Keeping all the other parameters constant, increasing only the retirement age for those in the SIS to 60 or 65 will decrease the present value of total cost to 9.8 (Table 3, row 2, column 5) and 8.1 billion euros (Table 3, row 3, column 5) respectively. It is important to note that the retirement age for the workers in the SSS system is currently 60 and the TRNC government is now on the verge of increasing it to 60 for those in the SIS system as well. However, our estimates reveal that doing that will decrease the present value of the total cost (PVT) / GDP ratio from 392% (Table 3, row 1, column 7) to 368% (Table 3, row 2, column 5) which will not be a cure for the fiscal problem. Even a more radical

increase from 55 to 65 will not be sufficient to decrease that ratio below 300% (Table 3, row 3, column 7) of GDP. This is an important indicator showing that the policy reforms to the system needs to be analyzed in a much more fundamental manner to determine if the PAYGO system is sustainable in the future.

It is also important to note the trade-off between increasing the retirement age and the replacement rate. Actual replacement rate increases as the retirement age increases. This trade-off is clearly stated by the OECD (2011). According to OECD pension models, “delaying retirement by five years from age 65 allows for a pension replacement rate of 72%, compared with 60% at 65. (The rate of 60% was chosen because it is approximately the average replacement rate for people with mean earnings in OECD countries.) Conversely, earlier retirement means that the given budget needs to be spread over a longer period. In this case, retiring five years earlier, at age 60 would result in a replacement rate of 52%” (OECD, 2011).

Sensitivity Analysis for Alternative Replacement Rates

One of the main determinants of the size of the pension benefits to be collected by retirees is the level of the replacement rates built into the pension rules. The magnitude of the fiscal deficit of a pension system is largely determined by the replacement rate formulae especially when the contributions are insufficient. As stated previously, the SIS system pays a replacement rate of 70% on average at a 55 year retirement age, this yields a total net cost of 10.4 billion euros in present value terms. A possible policy change would be to decrease the replacement rate on those contributing workers in the SIS system who have not yet retired to a level that is equal to the average rate in the OECD countries; that is to 60%. Such a change would decrease the total net cost of the entire pension system to the government by 14% from 10.4 to approximately 9 billion euros. Considering the pension cost of this

group of pension participants alone, their estimated net fiscal cost in 2009 values would decrease from 9.1 billion euros to about 7.7 billion euros. Furthermore, a 50% replacement rate would reduce the net fiscal cost of this group's pensions to 6.2 billion euros. The overall system would still produce a 7.5 billion euros deficit which is equal to 282% of GDP in 2009. Even with such a drastic decrease in the replacement rate, the present value of private sector employees' pension liability to GDP ratio would not be sustainable without outside assistance.

Sensitivity Analysis for Different Discount Rates

In our present value estimates we employed a real discount rate of 3%. However, in other studies of social security systems, researchers or scholars use various discount rates ranging from 2% to 4%⁹. As one expects, a discount rate of 4% reduces the present value of the total cost of the pension system from 10.4 billion euros to 8.2 billion euros. On the contrary, a 2% real rate of discount produces a deficit of 13.5 billion euros in 2009 values. The PVT/GDP ratio varies between 309% and 507% when the annual net real costs are discounted at 4% and 2% respectively.

Sensitivity Analysis for Growth Rate in Real Wages

Another determinant of the sustainability of the existing system is the rate of growth in real wages of the contributing employees. The pension benefit under the SIS system is directly tied to the final years declared income before retirement. The data obtained from the Social Security Administration show that the average annual income declared by the contributors is very close to the minimum wage. In

⁹The appropriate discount rate for evaluating the funding requirements of pension plans is a topic of considerable debate. Real rates of discount in the range of 2% (Queisser and Whitehouse, 2006) to 4% (Brown, Clark and Rauh, 2011) appear to be appropriate for this situation. Hence, we employed a real rate of discount of 3% is used in our base case estimates with a sensitivity analysis conducted using real rates of discount of 2% and 4%. The average nominal interest rate paid on Euro zone long-term bonds in August 2010 (European Central Bank, 2011) was 4%, yielding a real rate of approximately 2% net of inflation in 2010.

2009, the minimum wage was 8,290 euros whereas the average annual income declared by the existing contributors (who were 68% men and 32% women) was 8,415¹⁰. This is mainly due to the fact that the minimum wage in North Cyprus is exempted from the income tax. On the basis of this statistical fact, it can be said that the minimum wage is the key determinant of the declared annual income in the private sector. In our base case assumption we used a 4.33% expected increase in real wage rate for men and 3.55% for women. Excluding the annual age-earnings premium for men (2.33%) and for women (1.55%), these figures correspond to a real wage growth of 2% each year. That is a 2% annual real increase in the minimum wage.

If real wages just grow as a result of seniority, the total net cost of the system will be about 9 billion euros. On the other hand, if the real wages grow at a rate close to the historical growth in GDP; that is about 4.61%, then the present value of the fiscal burden of the system is equal to 11.3 billion euros which corresponds to a PVT/GDP ratio of 425%. In our base case assumption, this ratio is equal to 392% of the GDP in 2009.

Sensitivity Analysis for the Rate of Indexing the Value of Pension Benefits after Retirement

Another sensitivity test has been conducted to find out the fiscal impact of the real rate of indexation of individual pension benefits after retirement. Our base case assumption is that the retirees' pensions will not be increased in real terms. They will just be indexed to inflation although the historical practice was not the case. The present value of the deficit reaches a maximum value of 24.5 billion euros, or 922% of GDP when the real growth rate of pension indexing is taken as 4.61%, the historical real growth rate of GDP. In fact this is close to the historical real rate of indexation of SIS pension benefits until 2008. The present value of the deficit has a minimum value of 8.8 billion euros, or 330% of GDP, when the

¹⁰8,415 = (8,467*68%) + (8,308*32%), where 8,467 was the average income declared by men and 8,308 was the annual income declared by women.

real growth rate of pension benefit indexation is taken as a minus 1%, that is; a cut in real pension benefits over time¹¹.

It is clear from the results above that an increase in the real growth rates of wages for working private sector employees under the SIS and pensions for retirees from the same system amplifies the deficit, while decreasing the growth in real wages and pension benefits produces an opposite effect. However, in every case the burden of the costs as compared to the annual GDP is enormous considering that we are discussing only one part of the publicly sponsored pension system in North Cyprus since the issue of the deficit of the civil service pension system applicable to workers in the public sector is beyond the scope of the present paper.

6. Analysis of Policy Options for Reducing the Annual Fiscal Burden of the Deficit of the Social Security Systems

To this point, the emphasis of the analysis has been on the size of the implicit debt being created by the historical SIS system. We now want to turn to the practical challenges this PAYGO system creates for the annual public sector budget over the 35 year period from 2010 to 2045. This impact is measured by the proportion of the annual SIS deficit (minus the SSS contributions) to the projected tax revenues in the same future year.

¹¹ A falling real value of pension benefits is fairly normal in many private pensions around the world as it is believed (and agreed to by unions) that people's expenditure requirements fall with aging. Changing the rate of indexing again alters two adjustments discussed above. For rates of pension indexing of 4.61, 4.0, 3.0, 2.0, 1.0, 0.0 and -1.0%, the adjustment of 2% remains constant for the effect of deaths prior to retirement. However, the adjustments to the costs of the system due to the rate of indexing of pension after retirement are upward adjustment of 4.0, 2.0, 0.0, and a downward adjustment of 2.0, 3.5, 4.5 and 5.5%, respectively.

Another critical issue is what proportion of the GDP must be set aside from other people's consumption and saving each year to be used by the retirement community. This is measured as the ratio of the SIS annual deficit (minus the SSS contributions) to the projected GDP of the same year. To ease the understanding of the evolution of these two issues over time, in Table 4 below, we only report these ratios for every fifth year.

Table 4: Annual Pension Deficit (APD) / Tax Revenue & Annual Pension Deficit / GDP

		1	2	3	4
		APD / TAX REVENUE		APD / GDP	
		Without T.W. Contributions	With T.W. Contributions	Without T.W. Contributions	With T.W. Contributions
1	2015	31.99%	30.46%	8.01%	7.63%
2	2020	30.32%	30.02%	7.86%	7.52%
3	2025	30.89%	29.70%	7.74%	7.44%
4	2030	31.81%	30.76%	7.97%	7.71%
5	2035	30.52%	29.60%	7.65%	7.42%
6	2040	20.39%	19.57%	5.11%	4.90%
7	2045	11.80%	11.08%	2.96%	2.78%

Table 4 above shows the trend of proportion of the annual pension deficit (APD) to annual tax revenue and to annual GDP over time. The analysis is conducted from two different perspectives. The first one does not include the contributions of the temporary workers in the calculation of the annual deficit whereas the second one does. The aim here is to show the net impact of the temporary workers on the fiscal sustainability of the system.

With the assumption that people who were already over 55 in 2009 will retire at different ages before they reach 70¹², and the other existing contributors in the system will retire at an average age of 55, it is estimated that with and without the contributions of temporary workers, the APD / annual Tax Revenue ratios in 2015 will be 31.99% (Table 4, row 1, column 1) and 30.46% (Table 4, row 1, column 2)

¹²According to our assumption, people who are between the ages of 55 - 59, 60 - 64 and 65 - 69 in 2009 will retire at the ages of 60, 65 and 70 respectively.

respectively. Under the same assumption, the APD / GDP ratios are estimated to be 8.01% (Table 4, row 1, column 3) with and 7.63% (Table 4, row 1, column 4) without the contributions of temporary workers.

Between 2015 and 2040, under the base case assumption, the amount of tax revenue and GDP used to finance the annual cost (cash payments minus cash contributions) of the pension system show a steady downward trend. This is because the number of retirees is replaced with the number of new entrants. The expected growth in labor force whose contributions are used to finance the cost of the PAYGO system counterbalance the growth in real wages of the contributors. Although the ratios are stable, they are very high and point out the fiscal unsustainability of the system. Even with the contributions of the temporary workers, the average ratio of APD to Tax Revenue is around 30% (Table 4, column 2). Expressing these net cash APD's for each year as a ratio of GDP of that year we find that it is about 7.6% in 2015 (Table 4, row 1, column 4) and generally trends downward over the next 30 years to become 2.78% of GDP by 2045 (Table 4, row 7, column 4)¹³.

After 2040, however, the number of retirees who pass away each year relative to the number of new people who retire each year increases as the new permanent workers in the SSS system, under the new law, can only retire at an average age of 60 or above. This increases the dependency ratios for the years between 2040 and 2045. These dependency ratios under our assumptions are presented in the Table 5 below. In addition to this, our base case assumption that keeps the pension benefits constant in real terms over time reduces the annual deficit to annual Tax Revenues and annual deficit to GDP ratios. Another factor behind this downward movement in these ratios is the survivors benefits paid. It is worth to restate that the widows, who are counted as retirees, receive 50% of the husband's pension

¹³It is important to note that on average for OECD countries, gross pension spending (before subtracting contributions) on old-age pension benefits and survivors benefits alone was 7% of GDP in 2007 (OECD, 2011).

benefit. This also decreases the annual pension deficit relative to the number of retirees in the system. In 2040, 19.57% (Table 4, row 6, column 2) of annual tax revenue is spent to pay the annual deficit of the SIS pension system. This ratio further decreases to 11.08% (Table 4, row 7, column 2) in 2045. When the burden is analyzed as proportion to the GDP, it can be seen that 4.90% (Table 4, row 6, column 4) in 2040 and 2.78% (Table 4, row 7, column 4) in 2045 of the country's total income is allocated to finance only the deficit of the SIS pension system.

Table 5: Support Ratios for the TRNC

		1	2	3	4	5	6	7
		2015	2020	2025	2030	2035	2040	2045
1	# of Contributors (with 2%)	67,592	73,565	80,159	87,379	95,417	104,291	114,089
2	# of Contributors (without 2%)	62,184	62,184	62,184	62,184	62,184	62,184	62,184
3	# of Retirees	31,020	35,641	41,720	44,594	50,137	47,709	44,430
4	Support Ratio (with 2%)	2.18	2.06	1.92	1.96	1.90	2.19	2.57
5	Support Ratio (W/out 2%)	2.00	1.74	1.49	1.39	1.24	1.30	1.40

The significance of the growth in labor force can be seen from the table above. In the case where the social security system does not grow and labor force stays the same, the dependency ratios fall below 2.00. Keeping the number of contributors constant at 62,184 yields a dependency ratio of 1.74 in 2020 and decreases thereafter and becomes 1.40 in 2045 (Table 5, row 5). This means that the number of contributors to the PAYGO system is only between twice and 1.4 times as large as the number of people drawing pension benefits. The average dependency ratio for the OECD countries was 4.1 and 3.5 for the EU 27 countries in 2010. However, due to the aging population, it is expected that these ratios could fall to as low as 2.00 and 1.8 in 2050 (OECD, 2011) respectively. Unfortunately, North Cyprus is at these crisis levels in 2011.

Change in Stock of Temporary Workers

One of the advantages that North Cyprus economy enjoys is to have ready access to a pool of Turkish labor of a wide range of skills at relatively low wage rates. The vast majority of this labor remains on the island as long as the job exists. Hence, the level of economic activity can expand and contract without either overheating the labor market or creating widespread unemployment. When there is demand for labor, the workers from Turkey are allowed to come to take jobs and when the economy contracts, the stock of workers decline relatively quickly as a greater number of people return to Turkey (often in their normal rotation) than in the number of new workers that are given worker permits to come from Turkey to work in the TRNC. These workers receive no pension benefits from the TRNC system, but the years worked in the TRNC can be counted in determining their social security pension in Turkey.

In the base case with a stock of 11,232 of temporary workers working in the TRNC, the present value of their contributions is 370 million euros. If the level of economic activity in the TRNC were to return to the level that it was in 2005-06, then the stock of this temporary labor force would increase to the 20,000 to 25,000 range once again. In the case that it increases to 20,000 as of 2015, the present value of the temporary workers' contributions (until 2045) is approximately equal to 660 million euros in 2009 values. If the stock increases to 25,000, then the amount of fiscal relief on the budget is 824 million euros.

The analysis also shows that if the rules in the new SSS system are fully implemented, then overtime the funding burden on the public sector budget begins to look more like a “normal” European country. Unfortunately, this does not appear to make a significant impact until 30 years have lapsed. There are simply too many relatively young retirees receiving generous pension benefits in the current social

insurance system for any set of pension reforms to have significant visible results in less than one generation.

If the economic performance of the TRNC stays as it is for the next 30 years with the same number of temporary worker employment, the ratio of APD to total tax revenue decreases from 30.46% in 2015 to 11.08% in 2045. However, if the economy expands more rapidly and the demand for more temporary labor increases to 15,000, 20,000 and 25,000 then the corresponding ratios for 2045 are 10.84%, 10.52% and 10.20% respectively. In the case of a more rapidly expanding economy that would require these additional temporary workers then the total amount of tax revenues is also expected to increase faster than with the base case assumptions. In our estimates, the increase in the amount of tax revenue is constant at its historical average at 4.61%. Hence, the ratio of APD to tax revenues will be significantly overstated for the more rapid growth scenario.

We also find that the impact of the contributions that are made by the stock of temporary workers while significant in absolute values do not have a dramatic effect on any of the ratios that measure the fiscal burden. Moving from 11,232 to 25,000 temporary workers first reduces the ratio of the APD from 7.63% of GDP to 7.16% of GDP in 2015 and from 2.78% to 2.56% in 2045.

It seems unrealistic that the size of the annual cash deficit of the social security system would continue to be in excess of 11% of annual tax revenues or 2.78% of GDP for the next 25 years. Although it is a political economy question, such a situation would require either an increasing level of budgetary support in real terms or an unprecedented level of sacrifice by current taxpayers to support relatively well-off pensioners.

A more realistic time horizon for such an adjustment of the social pension system to have taken place might be by 2030, or over the next 18 years.

A series of estimations are made for changes in two of the principal policy variables of the social security system, which are the age of retirement and the size of the pension received upon retirement. The latter is defined by the replacement rate of the pension system. A set of simulations are made to find the replacement rate that would yield an APD of 11% of tax revenues or less at different retirement ages¹⁴.

Table 6: The Trade-off between Retirement Age and Replacement Rate in order to reach an 11% APD / Tax Revenue Ratio by 2035

		Current SIS and SSS Contributing Participants Excluding Pensioners		Current SIS and SSS Contributing Participants Including Pensioners	
		1	2	3	4
	Retirement Age	T.W. Constant (as 11,232)	T.W. Doubles (as 22,464)	T.W. Constant (as 11,232)	T.W. Doubles (as 22,464)
1	55	44.61%	46.83%	28.15%	30.37%
2	60	63.14%	66.02%	41.81%	44.69%
3	65	Under this assumption it is already 2.00%	Under this assumption it is already 0.95%	Under this assumption it is already 9.78%	Under this assumption it is already 8.73%

In the first case only the current working participants of the SIS and the SSS pension schemes are considered in the calculations. It is assumed that the fiscal burden of the existing pensioners is dealt with in another fashion. The results are shown in Table 6, columns 1 and 2. If the same number of

¹⁴This ratio is the one that can be reached only in 2045 under our base case assumptions and the existing laws. A cash deficit of 11% of the tax revenues is equal to 2.78% of GDP because tax revenues are assumed to be 25% GDP. The following analysis that is presented in terms of the ratio of APD to tax revenues can equivalently be presented in terms of the ratio of ADP to GDP.

temporary workers continued to be contributing to the social security system as of now, and the retirement age is allowed to continue at 55 years of age, the replacement rate would have to be cut to about 45% (44.61%) from the current promise of 70% replacement rate (Table 6, row 1, column 1). This would mean that in the future the level of pension benefits would have to be reduced to about 60% of their current levels. Under the same assumption where the number of temporary workers is constant, at a retirement age of 60¹⁵, a replacement rate of 63.14% (Table 6, row 2, column 3) rather than 70% would yield an 11% APD / tax revenue ratio in 2030. This would only require a reduction in the initial pension benefits of about 13%. If the retirement age were to be increased to 65 in the near future, our estimations reveal that such a policy change would yield an APD / tax revenue ratio of 2.00% in 2030. Clearly increasing the retirement age is a very important option for reducing the fiscal gap in the social security system. With such a major reform, a cash balanced pay-as-you-go (PAYGO) system is not quite reached. There still would be an annual cash deficit that would need to be financed by the taxpayers of the country.

If the number of temporary workers were allowed to double and become 22,464, then at retirement ages of 55 and 60 the corresponding replacement rates that would yield an APD to tax revenue ratio of 11% are 46.83% and 66.02% (Table 6, column 2) necessitating a reduction in the actual benefits of new retirees of 33% and 6% respectively. It is also estimated that increasing the retirement age to 65 for all the contributors in the system almost satisfies the goal of attaining a zero cash deficit by 2030.

Doubling the number of temporary workers can be possible by economic expansion in the TRNC which would also increase the amount of tax revenues collected annually. Therefore, considering this

¹⁵It is important to note that the retirement age for the SSS contributors has already increased to 60 and it is very likely that very soon it will increase to 60 for the SIS contributors as well.

fact we need to mention that our estimates would be overstated and smaller cuts in the pension benefits would be sufficient to attain 11% APD / tax revenue ratios.

In the second case where the cost of the existing pensioners was also taken into consideration, the existing contributors would need to sacrifice a very significant amount of their future pension benefits in order for the social security system to attain an 11% APD / tax revenue ratio by 2030. In the absence of a structured welfare system, in the past the SIS system fulfilled this role. It is not sound tax or labor market policies to require that the current and future cost of these rather loose pension arrangements of the past be financed through what is essentially a payroll tax on existing workers. One should not create a major tax distortion in the labor market of the existing contributing workers to finance the budgetary burden created by the existing pensioners under the old SIS system. This burden needs to be considered as a state problem and be financed through general tax revenues. Our estimates regarding the various policies to minimize this burden support this statement. Table 6 (columns 3 and 4) summarizes our findings on this issue.

In the case where the number of temporary workers is kept constant, the required cuts in the pension benefits of the existing workers would range from 60% with a required replacement rate of 28.15% when the retirement age is 55 (Table 6, row 1, column 3) and 40% with a replacement rate of 41.81% if the retirement age was to increase to 60 years of age (Table 6, row 2, column 3). In the case where the retirement age was 65, with a replacement rate of 70%, 9.78% of the total annual tax revenues would need to be spent to finance the annual pension deficit of 2030.

Column 4 of Table 6 shows the estimated replacement rates that would yield an 11% APD / tax revenue ratio in 2030 for different retirement ages when the number of temporary workers is doubled.

If the number of the temporary workers were to double, then despite minor improvements, the estimated cuts in the replacement rate would still be so significant that the implementation of such a policy would again be unrealistic. At retirement ages of 55 and 60, the replacement rate needs to be reduced to 30.37% and 44.69% in order to reach the targeted deficit rate in 2030 relative to the annual tax revenue of the same year. A more radical reform of increasing the retirement age to 65 would still produce an APD / tax revenue ratio of 8.73% in 2030 (Table 6, row 3, column 4).

It would be a better tax and pension policy if the reforms to the system were to focus on the problem of financing the pensions of current and future workers rather than using the contribution rates of these workers to finance the fiscal imbalances created by the past decisions.

7. Conclusions

As a conclusion, it can be stated that in North Cyprus the present value of the burden of the social security deficits that is about 10.5 billion euros or 392% of GDP is generally the largest for any jurisdiction in Europe. No single policy option can adequately address this problem and any solution will take many years of either sacrifice by the taxpayers or external assistance before a sustainable situation can be created¹⁶.

The new SSS system has addressed some of the structural issues present in the old SIS system. However, it appears that any long term solution will require either some combination of an older retirement age and lower rate of pension benefits or substantial increases in the contribution rates to the system. Increasing the contribution rates is not a realistic option owing to the increased level of tax

¹⁶It should be noted that the Euro area had an estimated implicit general government pension obligation (civil service plus private coverage of social security) of 217% of GDP in 2005 values (European Commission, 2006). Together with the deficit of the civil service pension system, this ratio is (276% + 392%) 669% of the GDP for the TRNC.

evasion it produces in the TRNC (Besim and Jenkins 2005). Because of the history of inflation, there is a high level of uncertainty about the real value of the pension benefits. Hence, people are reluctant to pay high contribution rates that effectively turn over most of their personal savings to the government to finance a defined benefit pension plan. As a result workers collude with their employers to lower their reported income for the social security contribution and income tax purposes. In this case, people simply opt for a lower level of pensions while at the same time government loses income tax revenues.

A generous social security pension system is no longer a viable long-term solution for old-age support in the TRNC. Neither is a policy of forcing the current generation of workers to pay for the generosity of the previous generations of politicians. Much of the large pension deficit created by the existing pensioners will need to be borne by the use of general tax revenues or more likely fiscal transfers from Turkey. For the new members of the labor force, it would likely appear attractive for the TRNC to follow the policy trend in some emerging Latin America and European countries and others such as Canada and the US to rely more on private defined contribution pensions with perhaps tax deductions of contributions to augment a more basic level of public sector social security pensions.

References

- Besim, M. and Jenkins, G. P. (2005) Tax compliance: when do employees behave like the self-employed? *Applied Economics*, 37, pp. 1201-1208.
- Brown, J. R., Clark, R. and Rauh, J. (2011) The economics of state and local pensions. *Journal of Pension Economics and Finance*, 10(2), pp. 161-172.
- Civil Servants Law, (2010) Turkish Republic of Northern Cyprus.
- Civil Servants Law, (1977) Turkish Republic of Northern Cyprus.
- European Central Bank, (2011) *Long-term Interest Rate Statistics for EU Member States*, [online] Available at: <http://ecb.int/stats/money/long/html/index.en.html> [Accessed 12 September 2011].
- European Commission, (2006). *The impact of ageing on public expenditure: projections for the EU25 Member States on pensions, health care, long-term care, education and unemployment transfers (2004-2050)*.
- Grech, A. G. (2010) *Assessing the sustainability of pension reforms in Europe*, Center for Analysis of Social Exclusion, London School of Economics.
- IMF, (2011) *The Challenge of Public Pension Reform in Advanced and Emerging Economies*, prepared by the Fiscal Affairs Department.
- Devesa, J. E. and Devesa, M. (2010). The cost and actuarial imbalance of pay-as-you-go systems: the case of Spain. *Journal of Economic Policy Reform*, 13(3), pp. 259-276.
- OECD, (2011) *Pensions at a Glance 2011: Retirement-income Systems in OECD and G20 Countries*, OECD Publishing.
- OECD, (2007) *Pensions at a Glance: Public Policies across OECD Countries*, OECD Publishing.
- Palacios, R. and Whitehouse, E.R. (2006) *Civil-service Pension Schemes Around the World*, Social Protection Discussion Paper no. 0602, World Bank, Washington D.C.
- Queisser, M. and Whitehouse, E.R. (2006) “*Neutral or Fair? Actuarial Concepts and Pension-System Design*”, Social, Employment and Migration Working Paper no. 40, OECD.
- Social Insurance Law, (1976) Turkish Republic of Northern Cyprus.
- Social Security Law, (2007) Turkish Republic of Northern Cyprus.
- State Planning Organization, (2010) *National Accounts*, Turkish Republic of Northern Cyprus.
- World Health Organization, (2011) *Global Health Observatory Data Repository*, [online] Available at: <http://apps.who.int/ghodata/?vid=720> [Accessed 18 May 2011].