ARMENIA PENSION SYSTEM REFORM OPTIONS

1. Introduction

During my previous visit to Armenia from June 26 to July 2, 2005, I examined the design and financial condition of the current pension system. My conclusion was that the current pension system fails to meet all the primary goals and objectives for a healthy system. The primary problems identified in my previous report were:

- *Benefits inadequate except for the very lowest paid.* A pension system should provide a minimum replacement ratio (ratio of pension benefit at moment of retirement to the salary just prior to retirement) of about 40%. The current system meets this goal only for the very lowest paid
- *System is not fiscally sustainable*. Even with the current high contribution rates and low level of benefits, the system will have deficits beginning in about 2021 and will be bankrupt by 2026, assuming no major changes in current benefits, contributions and overall economic conditions
- *Contributions way too high in relation to benefits received, particularly for the highly paid*. Although pension benefits are not directly related to contributions paid, it is possible to calculate the approximate rate of return that workers earn on their contributions. This calculation shows that the pension system is not fair – it gives far less in benefits than it should, given the level of contributions
- *Strong incentive to evade completely or significantly understate workers' salaries.* In the current system, the benefit is the same regardless of the worker's salary. However, required payroll contributions vary with pay. Also, there is very little reward for increased years of contributions. Consequently, it is in workers' and employers' best interest to pay contributions on the lowest possible salary or to avoid paying contributions entirely.

During this visit, I was asked to propose several plan design options that help to solve these 4 problems and that meet the goals and objectives stated in the government's April 2005 pension reform concept paper. This report updates the financial calculation for the current pension system based on new data and presents two possible design options for the reformed pension system. Certainly these are not the only two possible options, but they clearly illustrate the primary components necessary for a successful reform.

- Improve benefits, particularly for the higher paid so that replacement ratios for everyone are 40% or more
- Make the benefit formula more fair by relating pension benefits more closely to contributions paid
- Make sure that the amount contributed at all salary levels is more reasonable in relation to benefits received
- Make sure the plan encourages employers and workers to voluntarily make required contributions rather than giving them an incentive to evade
- Make the system fiscally sustainable in the short and long-term.

In preparing my reform proposals, I chose to keep the existing pension system rather than replacing it completely. The current design doesn't work well as a stand-alone system, but in my opinion, with some adjustments, it can help meet the desired objectives as one component of a reformed system. As a result, the two reform proposals keep the base and supplemental benefits as one component of the overall reformed system. In order to meet the stated goals, the reform proposals I am presenting have the following key features:

- Total required contributions are immediately increased but benefits are also immediately improved for all current pensioners and workers
- Target replacement ratios increase to 40% or more for all salary groups over time
- Benefits are much more closely and clearly related to contributions made

- Those with longer service get significantly higher benefits than those with shorter service
- The non-earnings related portion of the pension benefit formula is financed with a non-earnings related contribution by employers
- The earnings-related portion of the benefit is directly related to the amount of contributions made
- SSIF is no longer required to finance privileged pensions and occupational disabilities.

As a result of these changes:

- The replacement ratio by salary level is more equitable than in the current pension system
- The pension system provides reasonable benefits in relation to contributions made
- The pension system provides stronger incentives for employers and workers to voluntarily make contributions to the reformed system

While problems and issues still remain after the proposed reforms, the net result is a far more equitable and sustainable pension system for everyone. The two designs analyzed in this report are:

- *Reformed system based on notional accounts*: This reform option implements the existing pension law, which requires a base benefit, supplemental benefit and a benefit based on notional accounts. This is an excellent option for a country that wants a slow transition to a true multi-pillar system. It allows time for development of local capital markets and the institutions necessary to support a multi-pillar system. This was the strategy followed by Mongolia, for example.
- *Implementation of a mandatory accumulation system*: This reform option adds a mandatory accumulation system immediately as a supplement to the existing solidarity system and does not implement notional accounts at all.

Purely for purposes of illustration, both options are assumed to be implemented on January 1, 2006. In reality, neither system can be implemented that quickly. It would require about one year to prepare for the start of a notional account system and would take a minimum of 3 years to fully prepare for the start of a mandatory accumulation system.

Although not discussed in detail in this report, the accounting procedures used by SSIF should be changed to comply with International Accounting standards. In addition, contributions to SSIF should be separated to identify the portion financing pensions, unemployment and temporary disability or alternatively, three totally separate insurance funds should be created. It is important to know what portion of the total contribution is needed to finance each of these three separate social insurance programs and what the financial results are for each component each year.

The remaining sections of this report show updated financial projections for the current pension system, and for the two pension reform options discussed above. The financial projections for the current system detailed in my July 2005 report have been updated to reflect additional information received from the government of Armenia.

2. Financial Analysis of the Current Pension System

In order to evaluate the alternative pension reform designs, it is first necessary to prepare analysis for the current pension system. In preparing these projections, I have made the following key assumptions:

- The current formulas for employer and employee contributions to the pension system remain the same. However, the employer contribution formula (flat amount in dram and the 20,000 and 100,000 limits used in calculation of the wage-related portion of the contribution) are periodically updated so that total contributions remain a constant percentage of the total wage fund (approximately 21.4% in 2005). If this isn't true, then contributions would quickly become even more inadequate than they already are
- The planned increases in base and supplemental benefits for 2006, 2007, and 2008 will be implemented. These increases are just sufficient to keep the average replacement ratio unchanged. I assumed the formula would be further adjusted in the future to keep the replacement ratio constant at 21.9% (the current level) in the future. In the absence of this assumption, replacement ratios would rapidly plummet

- Benefits for existing pensioners will be recalculated each time the benefit formula for active workers is changed. This is equivalent to indexing pensions to nominal wages
- Replacement ratios for disability and survivor pensions remain the same as they are today and the rules for awarding disability pensions remain unchanged
- There are no major improvements in compliance (i.e., the evasion rate remains the same) so the number of contributors remains significantly lower than it would be with full compliance

The following tables show the benefits and financial status of the current pension system. These same tables (with minor modifications) will be shown for each of the two reform proposals. Below is a brief description of each table and its significance.

Table 1, Replacement Ratio by Years of Service, Worker Earning the Average Wage. This table demonstrates how benefits from the pension system vary with years of service. The Base benefit is the same for everyone regardless of years worked. The supplemental benefit varies with years worked. This table shows that a worker must contribute for 25 years in order to double the benefit paid to someone who has never worked. There is little incentive for employers and workers to contribute to the current system. They would be better off evading and receiving a pension of just 4,000 dram per month and saving the money that would otherwise have been contributed.

Table 1
Replacement Ratio by Years of Service, Worker Earning the Average Wage

Years of	Base	Supplemental	Total	Replacement Ratio		
Service	Benefit	Benefit	Benefit	Base	Supplement	Total
0	4,000	-	4,000	8.16%	0.00%	8.16%
5	4,000	160	4,160	8.16%	0.33%	8.49%
10	4,000	640	4,640	8.16%	1.31%	9.47%
15	4,000	1,440	5,440	8.16%	2.94%	11.10%
20	4,000	2,560	6,560	8.16%	5.22%	13.39%
25	4,000	4,000	8,000	8.16%	8.16%	16.33%
30	4,000	5,280	9,280	8.16%	10.78%	18.94%
35	4,000	6,720	10,720	8.16%	13.71%	21.88%
40	4,000	8,320	12,320	8.16%	16.98%	25.14%

Table 2, Replacement Ratio by Salary, Worker Retiring with 30 Years of Service. This table shows that someone earning the average wage and retiring with 30 years of service receives a replacement ratio of 18.94%. This is less than half of the ILO's recommended minimum replacement ratio. The situation for higher paid workers is far worse. Someone earning 250% of the average wage (about 125,000 dram in 2005) has a replacement ratio of less than 8%. Only those earning less than 50% of the national average wage (about 25,000 dram in 2005) have a replacement ratio of 40% or more.

Table 2
Replacement Ratio by Salary, Worker Retiring with 30 Years of Service

Percent of	Base	Supplemental	Total	Replacement Ratios		
Average Salary	Benefit	Benefit	Benefit	Base	Supplemental	Total
50%	4,000	5,280	9,280	16.33%	21.55%	37.88%
100%	4,000	5,280	9,280	8.16%	10.78%	18.94%
150%	4,000	52,280	9,280	5.44%	7.18%	12.63%
200%	4,000	5,280	9,280	4.08%	5.39%	9.47%
250%	4,000	5,280	9,280	3.27%	4.31%	7.58%

Table 3, Contribution Amount by Salary. This table shows the amount the employer and employee are required to contribute to the current pension system, as a function of salary. As can be seen, someone earning 250% of the average wage contributes more than twice as much as someone earning the average wage, yet receives the exact same pension benefit in dram. Although the contribution as a percent of salary declines with increasing salary, the absolute amount in dram still increases sharply. This means a high-paid worker pays much more to receive the same benefit and has every incentive to understate actual earnings.

Table 3
Contribution Amount by Salary

Percent of Average Wage	Salary	Employer	Employee	Total	Percent
50%	24,500	5,675	735	6,410	26.2%
100%	49,000	9,350	1,470	10,820	22.1%
150%	73,500	13,025	2,205	15,230	20.7%
200%	98,000	16,700	2,940	19,640	20.0%
250%	122,500	18,125	3,675	21,800	17.8%

Table 4, Projected SSIF Revenue, Expense and Surplus as % of GDP. All figures are based on International Accounting Standards. This means the calculated revenue and expenditures are on an accrual accounting basis and not on a cash basis. Consequently, they may differ from the amounts shown in SSIF financial statements. Also, this table reflects only revenues and expenditures for which SSIF is responsible. Amounts received by SSIF from the State budget and paid by SSIF to State budget organizations are ignored. This table shows that SSIF is likely to have a deficit in 2005 and 2006 on an accrual accounting basis. This will be followed by surpluses through 2023. During this time, reserves equal to about 4.5% of GDP will be accumulated. However, these reserves will be fully exhausted by 2030 and the system will have deficits for the remainder of the 75 year projection period. This is in sharp contrast to the projections I prepared in 2001 that showed the system was likely to have a surplus in all years. The primary reason for this deterioration is that contributions have declined from 29.5% of the wage fund to 21.4% today while average replacement ratios have remained almost the same (although the absolute level of benefits has significantly increased).

Table 4
Projected SSIF Revenue, Expense and Surplus as % of GDP

	2005	2006	2007	2008	2020	2040	2060
Total Revenue	62.7	68.9	78.2	88.7			
Total Expenditure	65.3	71.1	77.0	83.6			
Surplus/Deficit	(2.6)	(2.2)	1.2	5.1			
Total Revenue as % GDP	3.1	3.1	3.2	3.3	4.4	4.0	3.4
Total Expenditures as % GDP	3.2	3.2	3.1	3.1	3.9	5.4	6.9
Surplus/Deficit as % GDP	(0.1)	(0.1)	0.1	0.2	1.5	(1.4)	(3.5)

Table 5, Rate of Return on Contributions by Salary. This table shows the relationship between contributions made and benefit received for a worker who contributes to the solidarity system for 30 years, retires at 63 and receives benefits until death. The table shows the theoretical "rate of return" that workers earn on the contributions they make to SSIF. The steps in the calculation are:

- Project contributions a worker would make each year during his or her working career to finance old-age benefits
- Calculate the expected benefit payment at retirement.

- Calculate the expected benefit to be paid in each future year taking into account indexing and the probability that the pensioner is still alive.
- Calculate the internal rate of return that makes the present value of the contribution in and benefit payments out equal to zero.

This gives a measure of the system's "fairness". As can be seen in the table below, only those with very low salaries have a positive real rate of return on their contributions to the current pension system. Those with higher salaries have a negative real rate of return and have every incentive to evade.

Table 5
Real Rate of Return on Contributions by Salary

Percent of Average Wage	Current Plan
50%	1.90%
100%	-0.16%
150%	-1.48%
200%	-2.46%
250%	-2.87%

These tables show all the reasons why the current pension system is in need of immediate reform. The remainder of this report will discuss two possible redesign options. For each option, the same tables will be shown to illustrate how the reform proposal addresses the shortcomings of the current pension system.

3. Description of Reformed System Based On Notional Accounts

The key feature of this reform proposal is the addition of notional accounts to the benefits already provided under the current pension system. Notional accounts are a formula for calculating benefits in a solidarity system that directly bases pension benefits received on the amount of contributions made by each worker during his or her working career.

Under this system, contributions made by each worker are credited to a hypothetical "bank account". Each year, the balance in the bank account is increased with hypothetical "interest" based on a formula contained in the pension law. At retirement, the worker's hypothetical account balance is converted into an annuity by dividing the account balance by a factor related to the worker's life expectancy at retirement age. In this way, the benefit is clearly related to the worker's contributions to the pension system. Notional accounts have been implemented in many countries, including Poland, Sweden, Latvia and Mongolia.

The key features of this reform proposal are:

- The Base and Supplemental benefits contained in the current law are retained. However, benefits are increased for everyone in 2006 and increases are greater for those with longer service. A worker earning the average wage and retiring with 30 years of service will receive a 25% replacement rate after the proposed increases. Those with higher or lower wages will receive proportionately greater or smaller benefits
- Notional accounts are assumed to be introduced on January 1, 2006. The target replacement ratio from just notional accounts for a worker earning the average wage with 30 years of service is about 15%, so the total replacement ratio from all components of the solidarity system will be about 40%. Those who are already expected to receive a benefit in excess of 40% from the Base and Supplemental benefits do not participate in the notional account system. Those with higher pay will contribute more and receive significantly higher benefits from the notional accounts than those with lower pay.
- A wage cap of 250% of the average wage is introduced. This means no worker must make contributions on pay in excess of the wage cap. As a result, no worker is required to make unlimited contributions

- Employers will fully finance the Base and Supplemental benefits by making a non-wage related contribution to SSIF for each worker. The current 5,000 dram contribution will be increased, but the earnings related portion of the employer contribution will be completely abolished. This will provide a much better relationship for all workers between contributions made and benefits received
- Workers will fully "finance" benefits from the notional accounts. Contributions are only required from those earning more than 50% of the national average wage and contributions are paid only on wages between 50% and 250% of the national average wage
- Pension benefits will continue to be paid at the retirement ages specified in the current law. However, employers will be required to pay benefits to privileged pensioners from date of retirement until the date the worker reaches his or her standard retirement age
- Disability pensions will be paid by SSIF only for non-occupational disability and only to those who are totally and permanently disabled. Occupational disability will be financed by employers and temporary disability will be separately accounted for within SSIF.

A summary of the proposed plan design is shown below.

3.1. Types of pension benefits and sources of financing

The types of benefits payable under the reformed pension system are not changed. However, the sources of financing are changed.

- Labor Pensions (financed from SSIF contributions): Old-age, Privileged, Long service, Disability, Survivors
- Non-pension benefits (financed from SSIF contributions): Unemployment, temporary disability and funeral allowances In the future, either separate funds should be established for temporary disability and unemployment or accounting procedures should be implemented to clearly identify financial results for each component separately
- Social Benefits (financed from budget): Old-age, Disability, Survivors
- Payments to State budget organizations (financed from budget): Primarily military
- Other benefits (financed by employers or other social insurance funds)
    - Payments to privileged pensioners prior to the standard retirement age
    - Payment of occupational disability benefits

3.2 Employer and Employee Contributions

The sources of contributions to finance the pension system are unchanged. However, contribution rates are increased to finance the improved level of benefits and the division of contributions between employers and workers and the formulas for calculating the contributions are significantly changed.

Contribution revenues are from:

- Payroll contributions (employer + employee)
- Self-employed contributions
- Transfers from the State budget to pay State pension benefits
- Transfers from (or direct payments by) employers or other social funds to finance occupational disabilities and privileged pensions

Employer and employee contributions to the SSIF are:

- Employer: Flat 9,000 dram per worker. This amount finances the base and supplemental (non-NDC) portion of the solidarity system benefit
- The employee contribution rate is 12% of wages between 25,000 and 125,000 dram in 2006 (approximately 50% and 250% of the expected national average wage in 2005). These limits are indexed annually to changes in the national average wage.

3.3 Retirement Age and Service Requirements

Retirement ages are unchanged from the current law for both ordinary and privileged retirements. However, payments to privileged pensioners are reimbursed by employers prior to the time workers reach standard retirement age.

3.4 Old-Age Benefit Formula

Pension benefits are the sum of two parts – one is related to wages and the other is not. The principle of notional accounts, as described in the current pension law, is activated.

Non-wage related portion

The non-wage related portion of the benefit has the same structure as the current pension system. It is based on the sum of a Base and Supplemental pension. The Base portion is not related to pay or service while the supplemental portion is related to service but not pay.

The benefit formula is: $P = B + (V)(n)(K)$, where:

- B = Base Benefit (4000 AMD in 2006 and indexed thereafter)
- V = Supplement (250 AMD in 2006 and indexed thereafter)
- n = years of service
- K = coefficient. If $n <= 25$, $K = .04 \times n$; if $n > 25$, $K = 1 + .02 \times (n-25)$

This portion of the pension benefit is financed by employer contributions only.

Wage-related portion (notional accounts)

This portion of the benefit is "financed" entirely by employee contributions. The benefit payable to the worker at retirement is based on the principle of notional accounts. Employee contributions are "credited" to a hypothetical account and credited with hypothetical interest each year. At retirement the hypothetical account balance is converted to an annuity based on life expectancy at retirement age. *Note that employee contributions are used to meet benefit obligations to current pensioners and are not actually saved or invested on behalf of the worker. Notional accounts is nothing more than an alternative method of calculating benefits in a solidarity system that directly relates ultimate retirement benefits to contributions made to the system by employees throughout their working career.*

The goal is to provide workers with 30 years of service with a total pension benefit equal to 40% of pay at retirement. The sources of the total pension benefit for a worker earning the average wage are shown in the table below:

Source of benefit	*Benefit as % of pay*
Base benefit	8%
Supplemental benefit	17%
Notional Accounts	15.0%

3.5. Pension indexing

Pensions are not formally indexed under current law. However, the government has consistently followed a policy of recalculating benefits for existing pensioners whenever the benefit formula for current workers is improved. Since benefit improvements have effectively kept the average replacement ratio unchanged, the net effect of this policy is that pension benefits are indexed to nominal wages.

- Base and Supplemental benefits for all pensioners will be recalculated each year based on the formula in effect for new pensioners in that year. Since the "B" and "V" factors in the current benefit formula will be indexed to increases in wages, Base and Supplemental benefits will be wage indexed as well
- Benefits from notional accounts will be indexed to inflation only.

3.6. Disability Benefits

Disability benefits payable by SSIF under the reformed pension system will be restricted to those with total and permanent disability. Temporary disability benefits will continue to be paid by SSIF as well, but should be accounted for separately. Occupational disabilities will be paid by employers or a separate social insurance fund.

Disability pensions will be higher in the future. The labor disability benefit will be calculated using the same formula as for old-age benefits. When calculating benefits, service credit will be given from the date of disablement until the standard retirement age. Exact calculation procedures must still be determined.

To be eligible for a labor disability pension one with general disease must have a minimum period of service that depends on age, as shown below.

Age	*Years of Service*
Less than 23	2
23-26	3
26-30	4
30 or more	5

There is no minimum service requirement for occupational pension benefits.

3.7. Survivor Benefits

Survivor benefits will remain as in the current law, except benefits will be calculated using service at date of death plus projected service from date of death to the standard retirement age. Exact calculation procedures must still be determined.

3.8 Mandatory accumulation system

Under the notional accounts option, there is no mandatory accumulation system. However, one may be introduced in the future. It is anticipated that contributions to notional accounts will stop at the time the mandatory accumulation system begins. If reserves are sufficient, notional account balances and equivalent assets may be transferred to the mandatory accumulation system at the start of the new system.

4. Financial Impact of Proposed Pension Reform Based on Notional Accounts

For purposes of my analysis and projections, I made the following assumptions.

- The new benefit formula, including notional account, takes effect on January 1, 2006
- The national average wage for 2005 will be 49,000 dram
- Existing pensioners receive about a benefit increase on January 1, 2006 so their average replacement ratio is increased to 25%
- Initial limits for contribution and benefit calculations are as stated for 2006 and are indexed to increases in the national average wage beginning in 2007
- Notional account balances are indexed to increases in the national average wage.

4.1 Financial analysis

The tables shown below illustrate the impact of this plan design on benefits and the financing of the pension system.

Table 1. A worker with 30 years of service now has a 40% replacement ratio. Now only 20 years of contributions are required to double the benefit from the base and supplemental benefits combined, rather than the 25 years required under the current plan. Note that the full 40% replacement ratio is only achieved by a worker with 30 years of participation in the notional accounts portion of the system.

Table 1 can also be used to estimate the replacement ratio from notional accounts for those retiring with less than 30 years' participation in the notional accounts. For example, assume a worker retires in 2016 with 30 years of total service and 10 years' participation in the notional accounts. The replacement ratio will be 25% from the Base and Supplemental benefits and 4.91% from notional accounts for a total of 29.91%.

Table 1
Replacement Ratio from Solidarity System by Years of Service, Worker Earning the Average Wage

Years of	Base	Supplemental	Notional Account	Total	Replacement Ratio			
Service	Benefit	Benefit	Benefit	Benefit	Base	Supplement	Notional	Total
0	4,000	-	-	4,000	8.16%	0.00%	0.00%	8.16%
5	4,000	250	1,201	5,451	8.16%	0.51%	2.45%	11.12%
10	4,000	1,000	2,406	7,406	8.16%	2.04%	4.91%	15.11%
15	4,000	2,250	3,606	9,856	8.16%	4.59%	7.36%	20.12%
20	4,000	4,000	4,807	12,807	8.16%	8.16%	9.81%	26.14%
25	4,000	6,250	6,012	16,262	8.16%	12.76%	12.27%	33.19%
30	4,000	8,250	7,213	19,463	8.16%	16.84%	14.72%	39.72%
35	4,000	10,500	8,413	22,913	8.16%	21.43%	17.17%	46.76%
40	4,000	13,000	9,619	26,619	8.16%	26.53%	19.63%	54.32%

Table 2. Now replacement ratios are very similar regardless of salary. A worker earning 250% of the national average wage has a replacement ratio of 33.9% compared to 39.7% for a worker earning the average wage. This is very different than the relationships under the current plan where workers earning 250% of the average wage have a replacement ratio of less than 8%. Note that those earning 50% of the national average wage or less have no benefit from notional accounts since the replacement ratio is already above the target of 40%. As wages increase, so does the portion of the total benefit coming from notional accounts.

Table 2
Replacement Ratio from Solidarity by Salary, Worker Retiring with 30 Years of Service

Percent of	Base	Supplemental	Total	Replacement Ratios				
Average Salary	Benefit	Benefit	Benefit	Base	Supplemental	Total Flat	Notional	Grand Total
50%	4,000	8,250	12,250	16.3%	33.7%	50.0%	0.0%	50.0%
100%	4,000	8,250	12,250	8.2%	16.8%	25.0%	14.7%	39.7%
150%	4,000	8,250	12,250	5.4%	11.2%	16.7%	19.8%	36.5%
200%	4,000	8,250	12,250	4.1%	8.4%	12.5%	22.4%	34.9%
250%	4,000	8,250	12,250	3.3%	6.7%	10.0%	23.9%	33.9%

Table 3. The higher paid still make greater contributions in dram to the solidarity system than the lower paid. However, the employer contribution is the same for all workers regardless of salary level. The employee contribution, which "finances" the benefit from notional accounts, is significantly greater for the high-paid than the low-paid, but the high-paid also get much higher benefits from the notional accounts. Note that the actual employee contribution is not 12% of pay for anyone. It actually varies from 0% of pay for the very low paid to a maximum of 9.6% for those earning 250% of the national average wage.

Table 3
Contribution Amount by Salary

Percent of		Solidarity with Notional Accounts					
Average Wage	Salary	Employer	Employee	Total	Employer	Employee	Total

Percent of		Solidarity with Notional Accounts					
Average Wage	Salary	Employer	Employee	Total	Employer	Employee	Total
50%	24,500	9,000	-	9,000	36.7%	0.0%	36.7%
100%	49,000	9,000	2,880	11,880	18.4%	5.9%	24.2%
150%	73,500	9,000	5,820	14,820	12.2%	7.9%	20.2%
200%	98,000	9,000	8,760	17,760	9.2%	8.9%	18.1%
250%	122,500	9,000	11,700	20,700	7.3%	9.6%	16.9%

Table 4. SSIF finances are not significantly improved under this option. There are still projected deficits in 2005 and 2006, although the average replacement ratio in 2006 is much higher and the projected deficit is less than under the current plan. Under this option, SSIF is projected to have surpluses through 2022 and accumulate a reserve of almost 10% of GDP. However, this surplus is fully exhausted by 2029 and there are deficits thereafter.

Table 4
Projected SSIF Revenue, Expense and Surplus as % of GDP

	2005	2006	2007	2008	2020	2040	2060
Total Revenue	62.7	78.8	91.4	105.9			
Total Expenditure	65.3	80.1	87	94.9			
Surplus/Deficit	(0.1)	(1.3)	4.4	11.0			
Total Revenue as % GDP	3.1	3.5	3.7	4.0	6.2	5.6	4.6
Total Expenditures as % GDP	3.2	3.6	3.6	3.6	5.4	9.2	12.9
Surplus/Deficit as % GDP	(0.1)	(0.1)	0.1	0.4	0.8	(3.6)	(8.3)

Table 5. The system is much fairer to all workers now. All workers can expect a positive real rate of return on their contributions to the solidarity system. In fact, the proposed design should probably be fine-tuned so the high paid don't earn a higher rate of return that the lower paid. While it's possible some workers could earn a higher rate of return by investing the contributions themselves, the overall rate of return in the solidarity system is approximately equal to what could be expected if contributions were invested in a conservative portfolio of medium term bonds. It is a significant improvement over the current system. Note that these results are for those participating in the notional accounts for 30 years. Results for those retiring in the next few years would not be as favorable.

Table 5
Rate of Return on Contributions by Salary

Percent of Average Wage	Notional Accounts
50%	1.66%
100%	2.18%
150%	2.47%
200%	2.68%
250%	2.80%

4.2 Incentives for compliance

The new design has far greater incentives for voluntary compliance than the current design. These incentives, combined with completion of the personification process, should generate significantly higher compliance and revenues to help offset the projected deficits that still exist under this proposed reform. Ultimately, the projected deficits can only be fully eliminated if most workers who are

required to participate in the system make contributions. Currently, almost 300,000 workers fully evade required contributions to the current pension system and those who do pay often make contributions on less than their full salary.

The primary incentives for voluntary compliance and easier enforcement under this proposal include:

- The employer contribution is based on number of workers only. The tax authorities do not need to audit salary levels to calculate the required contribution. The employer contribution is the same regardless of salary level
- Notional account benefits are directly tied to employee contributions. If workers pay less than they should, then ultimate benefits will be proportionately less as well. Consequently, workers have a greater incentive to contribute on their full pay and the pension system is "immunized" against underpayment of contributions.
- There is a wage cap of 250% of the national average wage. This keeps high-paid workers from having to pay very high contributions to SSIF and should encourage compliance
- Benefits are much more reasonable in relation to contributions paid. Employers and workers should no longer feel that they are getting "ripped off". They will be getting much better value for their money.

4.3 Potential concerns

- *Replacement ratio increases too slowly*. Some may want the replacement ratio to increase to 40% much more rapidly. Under this proposal, the full 40% replacement ratio is only achieved for most workers after 30 years of participation in notional accounts. However, for the low paid, the target replacement ratio is achieved immediately.
- *Burden on high paid workers is greater*. High paid workers must finance the notional account benefit with their own contributions. Although contributions are higher, the increase in benefits far outweighs the increase in contributions
- *Benefits for current pensioners are still too low*. Although the replacement ratio may exceed 40%, the absolute benefit amount is still very low. Unfortunately, if there were a minimum benefit equal to the poverty level, it would immediately bankrupt the solidarity system
- *Employer contribution is too high for low paid workers*. This could further discourage employers from hiring low-paid workers and could increase unemployment. On the other hand, employers no longer need to make salary-related contributions for higher paid workers. The new structure is likely to be difficult for employers that hire many minimum wage workers, and some adjustment to this formula may be needed
- *No opportunity for low paid to save more for their own retirement.* However, the proposed reform would eliminate the 3% contribution previously required from all workers. This amount could be saved to help supplement pensions.

4.4 Possible Alternative Designs

- Base and supplement benefits fund a 20% replacement ratio and notional accounts funds the other 20%. No immediate pension increase for current pensioners. I rejected this idea because I believe an increase in contributions requires some immediate increase in benefits to be politically acceptable
- Employer pays a lower flat amount plus % of pay from 25,000 to 125,000 dram. I personally like the concept that a flat benefit should be completely funded by a flat contribution. Those who receive the same benefit should have the same contribution made on their behalf. Consequently, I don't like this option
- Notional accounts are based on all pay or pay in excess of 13,000 dram, and the contribution percent is lower than 12%. For example, the contribution could be 7% of pay between 13,000 and 125,000 dram in 2006. This produces a different pattern of replacement ratios. There is greater disparity between the replacement ratios of the low and high paid, and the replacement ratio for the high paid will be significantly less than 40%

- The design could be accompanied by an explicit time frame for conversion to a true mandatory accumulation system. This would make it clearer that the intention is to move to a multi-pillar system over time and not have just a solidarity system.

5. Description of Reformed System Based on Mandatory Accumulation System Introduction

The key feature of this reform proposal is the addition of a mandatory accumulation system (Pillar 2). Pension benefits from the mandatory accumulation system are based on the actual balance in each individual's account at retirement. Under this system:

- Contributions made by each worker are transferred to a pension fund selected by the worker.
- The contributions for each worker purchase "units" in the pension fund based on the net asset value of the fund each day
- The pension fund invests the contributions in a diversified portfolio of assets that are valued daily
- Pension fund assets are held by a custodian on behalf of fund participants for safekeeping
- The total account balance at any point in time is based on contributions made, actual investment earnings less any fees charged by the pension fund managers and others
- At retirement, the worker's total account balance is converted into a monthly pension by purchasing an annuity from an insurance company. In this way, the benefit is absolutely and directly related to the worker's contributions to the pension system
- The entire system and all participating institutions are closely supervised and controlled by a government regulator.

The key features of this reform proposal are:

- The Base and Supplemental benefits contained in the current law are retained. However, benefits are immediately increased for everyone and increases are greater for those with longer service. A worker earning the average wage and retiring with 30 years of service will have a 25% replacement ratio from the base and supplemental benefits combined. Those with higher or lower wages will have proportionately greater or smaller benefits. There is no benefit from notional accounts in the solidarity system
- A mandatory accumulation system will be introduced. The target replacement ratio for a worker earning the average wage with 30 years of service is about 15%, so the total replacement ratio will be about 40%. Those who are already expected to receive a benefit in excess of 40% from the Base and Supplemental benefits combined (i.e., the very low paid) do not participate in the mandatory accumulation system. Those with higher pay will contribute more and will receive significantly higher benefits than those with lower pay. The goal is a nearly equivalent replacement ratio for all workers from the solidarity and mandatory accumulation systems combined
- A wage cap of 250% of the average wage is introduced. This means no worker must make contributions to the mandatory accumulation system on pay in excess of the wage cap. As a result, no worker is required to make very high contributions
- Employers will fully finance the Base and Supplemental benefits by making a non-wage related contribution to SSIF for each worker. The current 5,000 dram contribution will be increased to 9,000 dram immediately and the earnings-related portion of the employer contribution will be completely abolished. This will provide a much better relationship for all workers between contributions made and benefits received
- Workers will fully finance benefits from the mandatory accumulation system. Contributions are only required from those earning more than 50% of the national average wage and contributions are based on earnings between 50% and 250% of the national average wage only
- Pension benefits will continue to be paid at the retirement ages specified in the current law. However, employers will be required to pay benefits to privileged pensioners from date of retirement until the date the worker reaches his or her standard retirement age

- Disability pensions will be paid by SSIF only for non-occupational disability and only to those who are totally and permanently disabled. Occupational disability will be financed by employers and temporary disability will be separately accounted for within SSIF.

As can be seen, this system will be similar to the first option based on notional accounts but with the following key differences:

- Employee contributions will go into a true mandatory accumulation system and not to SSIF. This means contributions to and benefits from the solidarity system will be less. It also means contributions to the solidarity system will decrease as soon as the mandatory accumulation system begins.
- The solidarity system will be funded only by the employer flat contribution of 9,000 drams per worker. Given the current ratio of contributors to beneficiaries of 1:1 and an average expected pension benefit of 13,500 dram per pensioner in 2006, it is clear there will be deficits in the solidarity system in the short-run. This government will need a credible plan for financing this "transition cost". It isn't reasonable to expect the current generation of workers to pay for benefits for current pensioners and also finance their own retirement benefit.
- The solidarity system will pay the Base and Supplemental benefits only and the target replacement ratio for this system will be 25%
- The mandatory accumulation system will need to find safe, liquid, diversified investments to purchase, either in Armenia or abroad.

A full regulatory and administrative regime for the mandatory accumulation system will also have to be established prior to the time it begins. This will require a significant commitment from the government and is likely to take a minimum of 3 years following passage of the implementing legislation. The following will be needed prior to the start of the mandatory accumulation system:

- Effective, fully trained and staffed regulator for private pension funds
- Full set of procedures for licensing of pension funds and investment managers
- Bank custodians for safekeeping of assets
- Enhanced personified recordkeeping system capable of collecting and allocating contributions to both the solidarity system and among private pension funds
- Effective process for reconciling individual data and contributions and resolving discrepancies on a monthly basis
- Full set of regulations governing marketing and advertising, sales agents licensing and control, accounting procedures for pension companies and pension funds, investments, asset valuation, etc.
- Computer systems for the government regulator for effective off-site supervision of pension companies and funds
- If overseas investments will be permitted, regulations governing foreign currency transactions, procedures for settlement accounts in foreign currency, sub-custodians, foreign asset managers, etc.

A summary of the plan design is shown below.

5.1. Types of pension benefits and sources of financing

The types of benefits payable under the reformed pension system are not changed. However, the sources of financing are changed to pay for the improvements in benefits.

- Labor Pensions (financed from SSIF contributions): Old-age, Privileged, Long service, Disability, Survivors
- Labor Pensions (financed from worker contributions to mandatory accumulation system): Old-age benefits only. Note that disability and survivor benefits will continue to be fully financed from the solidarity system

- Non-pension benefits (financed from SSIF contributions): Unemployment, temporary disability and funeral allowances In the future, either separate funds should be established for temporary disability and unemployment or accounting procedures should be implemented to clearly identify financial results for each component separately
- Social Benefits (financed from budget): Old-age, Disability, Survivors
- Payments to State budget organizations (financed from budget): Primarily military
- Other benefits (financed by employers or other social insurance funds)
    - Payments to privileged pensioners prior to the standard retirement age
    - Payment of occupational disability benefits

5.2 Employer and Employee Contributions

The sources of contributions to finance the pension system are unchanged. However, the contribution rates are increased to finance the improved level of benefits and the division of contributions between employers and workers and the formulas for calculating the contributions are significantly changed.

Contribution revenues *for the solidarity system* are from:

- Payroll contributions (employer only)
- Self-employed contributions
- Transfers from the State budget to pay State pension benefits
- Transfers from (or direct payments by) employers or other social funds to finance occupational disabilities and privileged pensions.

The mandatory accumulation system is fully financed by employee contributions.

Employer and employee contributions to the multi-pillar system are shown below.

- Solidarity system contributions: Flat 9,000 dram per worker paid by the employer only. This amount finances the Base and Supplemental benefits
- Mandatory accumulation system contributions: Financed only by workers. The employee contribution rate is 12% of wages between 25,000 and 125,000 dram in 2006 (approximately 50% and 250% of the expected average wage for 2005). These limits are indexed annually to changes in the national average wage.

5.3 Retirement Age and Service Requirements

Retirement ages are unchanged from the current law for both ordinary and privileged retirements. However, payments to privileged pensioners are reimbursed by employers prior to the time workers reach standard retirement age.

5.4 Old-Age Benefit Formula from Solidarity System

The benefit has the same structure as the current pension system. It is based on the sum of a Base and Supplemental pension. The Base portion is not related to pay or service while the supplemental portion is related to service but not pay.

The benefit formula is: $P = B + (V)(n)(K)$, where:

- B = Base Benefit (4000 AMD in 2006 and indexed thereafter)
- V = Supplement (250 AMD in 2006 and indexed thereafter)
- n = years of service
- K = coefficient. If $n <= 25$, $K = .04 \times n$; if $n > 25$, $K = 1 + .02 \times (n-25)$

This entire pension benefit is financed by employer contributions and the target replacement ratio for a worker with 30 years service earning the average wage is 25%.

5.5 Old-Age Benefits from Mandatory Accumulation System

This portion of the benefit is financed entirely by employee contributions. The benefit payable to the worker at retirement is equal to the annuity that can be purchased from an insurance company with the total account balance in the worker's individual account at retirement.

The target replacement ratio for the mandatory accumulation system for a worker earning the average wage with 30 years of service is 15%.

5.6. Pension indexing

Pensions are not formally indexed under current law. However, the government has consistently followed a policy of recalculating benefits for existing pensioners whenever the benefit formula for current workers is improved. The net effect of this policy is that pension benefits are indexed to nominal wages. This policy will be continued – Base and Supplemental benefits will be recalculated each year based on the formula in effect for new pensioners in that year. Since the "B" and "V" factors in the current benefit formula will be indexed to increases in wages, Base and Supplemental benefits will be wage indexed as well.

Indexing of benefits from the mandatory accumulation system will depend on the type of annuity the worker chooses to purchase from an insurance company.

5.7. Disability Benefits

Disability benefits payable by SSIF under the reformed pension system will be restricted to those with total and permanent disability. Temporary disability benefits will continue to be paid by SSIF as well, but should be accounted for separately. Occupational disabilities will be paid by employers or a separate social insurance fund.

Disability pensions will be higher in the future. The labor disability benefit will be calculated using the same formula as for old-age benefits. When calculating benefits, service credit will be given from the date of disablement until the standard retirement age. Exact calculation procedures must still be determined.

To be eligible for a labor disability pension one with general disease must have a minimum period of service that depends on age, as shown below.

Age	*Years of Service*
Less than 23	2
23-26	3
26-30	4
30 or more	5

There is no minimum service requirement for occupational pension benefits.

5.8. Survivor Benefits

Survivor benefits will remain as in the current law, except benefits will be calculated using service at date of death plus projected service from date of death to the standard retirement age. Exact calculation procedures must still be determined.

6. Financial Impact of Mandatory Accumulation System Introduction

For purposes of my analysis and projections, I made the following assumptions.

- The new pension system, including introduction of the mandatory accumulation system, takes effect on January 1, 2006
- The national average wage for 2005 will be 49,000 dram

- Existing pensioners receive about a benefit increase on January 1, 2006 so their average replacement ratio is increased to 25%
- Initial limits for contribution and benefit calculations are as stated for 2006 and are indexed to increases in the national average wage beginning in 2007
- Mandatory accumulation system contributions earn 4% real rate of return, inflation is 3%, and pension fund expense charges are 1% of assets and 6% of contributions

6.1 Financial analysis

The tables shown below illustrate the impact of this plan design on benefits and the financing of the pension system.

Table 1. This table shows that a worker earning the average wage with 30 years of service has a replacement ratio of 39.72%, with 25% from the Base and Supplemental benefits and 14.72% from the accumulation system. Under the notional accounts option, the total replacement ratio was the same, except the 14.72% came from notional accounts instead of the accumulation system. This implies that the benefits from notional accounts and the accumulation system would be identical. In fact, this would not be the case and there is no way to state categorically which would be higher. It will depend on factors such as actual investment return and expense charges in the mandatory accumulation system, the price insurance companies charge for annuities, and the factors in the pension law for indexing notional accounts and converting hypothetical account balances to annuities.

Table 1
Replacement Ratio by Years of Service, Worker Earning the Average Wage

Years of	Base	Supplemental	Accumulation	Total	Replacement Ratio			
Service	Benefit	Benefit	System Benefit	Benefit	Base	Supplement	Accumulation	Total
0	4,000	-	-	4,000	8.16%	0.00%	0.00%	8.16%
5	4,000	250	1,201	5,451	8.16%	0.51%	2.45%	11.12%
10	4,000	1,000	2,406	7,406	8.16%	2.04%	4.91%	15.11%
15	4,000	2,250	3,606	9,856	8.16%	4.59%	7.36%	20.12%
20	4,000	4,000	4,807	12,807	8.16%	8.16%	9.81%	26.14%
25	4,000	6,250	6,012	16,262	8.16%	12.76%	12.27%	33.19%
30	4,000	8,250	7,213	19,463	8.16%	16.84%	14.72%	39.72%
35	4,000	10,500	8,413	22,913	8.16%	21.43%	17.17%	46.76%
40	4,000	13,000	9,619	26,619	8.16%	26.53%	19.63%	54.32%

Table 2. This table shows just the solidarity portion of the benefit. A worker earning the average wage with 30 years of service receives a 25% benefit from the solidarity system rather than the 40% benefit under the notional accounts option. As in the current plan, replacement ratios drop very rapidly with increasing pay in the solidarity system. However, the accumulation system is biased in favor of the higher paid and the combination of the solidarity and accumulation systems gives nearly equal replacement ratios of about 40% to all workers just like the notional accounts option.

Table 2
Replacement Ratio from Solidarity by Salary, Worker Retiring with 30 Years of Service

Percent of	Base	Supplemental	Total	Replacement Ratios		
Average Salary	Benefit	Benefit	Benefit	Base	Supplemental	Total
50%	4,000	8,250	12,250	16.3%	33.7%	50.0%
100%	4,000	8,250	12,250	8.2%	16.8%	25.0%
150%	4,000	8,250	12,250	5.4%	11.2%	16.7%
200%	4,000	8,250	12,250	4.1%	8.4%	12.5%
250%	4,000	8,250	12,250	3.3%	6.7%	10.0%

Table 3. This table is identical to Table 3 for the notional accounts option. However, with notional accounts, both employer and employee contributions went only to the solidarity system. With a mandatory accumulation system, the employer contribution only goes to the solidarity system while the employee contribution goes only to the mandatory accumulation system.

Table 3
Contribution Amount by Salary

Percent of		Proposed			
Average Wage	Salary	Employer	Employee	Total	Percent
50%	24,500	9,000	-	9,000	36.7%
100%	49,000	9,000	2,880	11,880	24.2%
150%	73,500	9,000	5,820	14,820	20.2%
200%	98,000	9,000	8,760	17,760	18.1%
250%	122,500	9,000	11,700	20,700	16.9%

Table 4. This table illustrates the biggest difference between the notional accounts and mandatory accumulation system options. Since only the 9,000 employer contribution goes to the solidarity system, there are deficits in the first few years following introduction of the reformed pension system. These deficits, known as the transition cost, must be financed by the government. The usual methods of financing are issuing government bonds, using privatization proceeds or other one-time revenue sources and reducing expenditures in other budget categories. A credible plan for financing transition cost is one of the keys to a successful introduction of a mandatory accumulation system. In most countries, insufficient attention was given to transition cost financing and as a result, pension funds were required to invest most of their assets in government bonds.

Table 4
Projected SSIF Revenue, Expense and Surplus as % of GDP

	2005	2006	2007	2008	2020	2040	2060
Total Revenue	62.7	59.2	68.6	79.4			
Total Expenditure	65.3	79.3	86.0	93.6			
Surplus/Deficit	(2.6)	(20.1)	(17.4)	(14.2)			
Total Revenue as % GDP	3.1	2.6	2.8	3.0	4.4	4.2	3.5
Total Expenditures as % GDP	3.2	(3.5)	3.5	3.5	4.7	6.9	9.0
Surplus/Deficit as % GDP	(0.1)	(0.9)	(0.7)	(0.5)	(0.3)	(2.7)	(5.6)

Table 5. This table shows that all workers have a positive expected real rate of return on their employer's contribution to the solidarity system. If the 9,000 dram contribution were to be increased to reduce the size of the projected deficits, real rates of return might become negative.

Table 5
Real Rate of Return on Contributions by Salary

Percent of	Accumulation
Average Wage	System
50%	1.66%
100%	1.66%
150%	1.66%
200%	1.66%

Percent of Average Wage	Accumulation System
250%	1.66%

Table 6. This table illustrates the greatest potential strength of a mandatory accumulation system. It has the capability of accumulating large amounts of assets that can be invested to stimulate growth of the local economy. After 10 years, private pension fund assets should equal almost 10% of GDP. If properly invested in the real economy, the mandatory accumulation system has the potential to give Armenia a source of local capital to finance economic growth and will make Armenia less dependent on fickle foreign capital.

Table 6
Mandatory Accumulation System Contributions and Assets

Year	Starting Account Balance	Contributions	Interest	Benefit Payments	Expenses	Ending Account Balance	GDP	Assets as % of GDP
2005						-		
2006	-	18.97	0.66	0.02	1.23	18.38	2,239	0.82%
2007	18.38	22.03	2.06	0.04	1.62	40.80	2,445	1.67%
2008	40.80	25.53	3.75	0.07	2.08	67.93	2,670	2.54%
2009	67.93	29.42	5.79	0.12	2.61	100.42	2,908	3.45%
2010	100.42	33.70	8.21	0.20	3.21	138.91	3,160	4.40%
2011	138.91	38.47	11.07	0.28	3.92	184.25	3,425	5.38%
2012	184.25	43.65	14.43	0.45	4.71	237.15	3,705	6.40%
2013	237.15	49.22	18.32	0.61	5.61	298.47	3,997	7.47%
2014	298.47	55.19	22.82	0.84	6.62	369.02	4,302	8.58%
2015	369.02	61.52	27.98	1.05	7.75	449.72	4,619	9.74%

6.2 Incentives for compliance

This design has even more incentives for compliance than the notional accounts option. With a mandatory accumulation system, workers have a real account with real assets and real money rather than just a hypothetical paper account. Workers also have more direct control over how their pension contributions are invested, since they have the right to select a pension fund and transfer to another pension fund if not satisfied. Once again, this design makes the relationship between contributions made and benefits received far more transparent than under the current pension system.

6.3 Potential concerns

- *The transition cost may not be affordable*. The government will need to find sources of revenue to finance the expected transition costs.
- *Replacement ratio increases too slowly*. Some may want the ratio to increase to 40% much more rapidly. Under this proposal, the full 40% replacement ratio is only achieved for most workers after 30 years of participation in the mandatory accumulation system. However, for the low paid, the target replacement ratio is achieved immediately from the combination of the Base and Supplemental benefits.
- *Burden on high paid workers is greater*. High paid workers must make all contributions to the mandatory accumulation system and higher paid workers make greater contributions than lower paid workers. Although contributions are higher, the potential increase in benefits outweighs the increase in contributions
- *Lower paid may wish to contribute*. The proposed design prohibits workers earning less than 50% of the national average wage from participating in the mandatory accumulation system. Some of the low-paid may resent being excluded, especially if real returns are high

- *Benefits for current pensioners are still too low*. Although the replacement ratio may exceed 40%, the absolute benefit amount is still very low. Unfortunately, if there were a minimum benefit equal to the poverty benefit, it would immediately bankrupt the solidarity system
- *Employer contribution is too high for low paid workers*. This could further discourage employers from hiring low-paid workers and could increase unemployment. On the other hand, employers no longer need to make salary-related contributions for higher paid workers. The new structure is likely to be especially difficult for employers that hire many minimum wage workers

6.4 Possible Alternative Designs

- *Contributions to the mandatory accumulation system could be higher and the benefit from the solidarity system could remain the same or decrease*. At one extreme, the solidarity system could be eliminated entirely and all benefits could be financed through the mandatory accumulation system. I rejected the idea of eliminating the solidarity system completely because it would leave vulnerable groups without adequate benefits. Those who are unemployed or underemployed would not be able to make sufficient contributions to the mandatory accumulation system to finance an adequate benefit. Also, a mandatory accumulation system is incapable of providing adequate disability and survivor benefits to those who become disabled or die at a young age. Consequently, disability and survivor benefits must either be provided through a solidarity system, or by using a portion of the contributions to the mandatory accumulation system to purchase disability and survivor insurance from an insurance company. Since there is no viable life insurance industry in Armenia, this is not an option at this time. I also believe that a pension system must provide a minimum guaranteed benefit of at least 25% of pay. This benefit can either be a contingent liability of the State budget or it can (and in my opinion should) be financed through the solidarity system. My conclusion is that for the foreseeable future, Armenia needs to keep all disability and survivor benefits in the solidarity system and should have a minimum 25% replacement ratio in the solidarity system.
- *Adjust the current proposal to reduce transition costs:* In order to make the proposed option more financially sound, employer contributions to the solidarity system could be somewhat higher, increases in solidarity system replacement ratios could be delayed beyond 2006 or phased-in gradually, and the contributions to the mandatory accumulation system in the early years could start lower and be gradually increased
- *Retain a wage-based contribution to the solidarity system:* Employers could pay a larger contribution to the solidarity system, perhaps including a percent of pay from 25,000 to 125,000 dram. I personally like the concept that a flat benefit should be completely funded by a flat contribution. Those who receive the same benefit should have the same contribution made on their behalf. Consequently, I don't like this option. It would reduce the large projected deficits in the solidarity system, but it would also put an undue burden on the current generation of workers who would be required to pay for current pensioners as well as financing their own retirement savings
- *Alternative mandatory accumulation system contribution formula:* Contributions to the mandatory accumulation system could be based on all pay or pay in excess of 13,000 dram, and the contribution rate could be lower than 12%. For example, the contribution could be 7% of pay between 13,000 and 125,000 dram in 2006. This produces a different pattern of replacement ratios. The higher paid would get significantly lower replacement ratios than under my proposal while the lower paid would have higher replacement ratios

There are a few other important comments that should be made about mandatory accumulation systems.

- There is no point in creating a mandatory accumulation system with a very small contribution percent. In my opinion, the contribution to the mandatory accumulation system should be at least 5%. Otherwise, it is difficult to justify the expenses and preparation time required to implement it.
- The transition cost must be affordable. If most pension fund investments are in government bonds, then in reality, there is still only a solidarity system, but with much higher expenses than before. The only beneficiary of such an arrangement is the government.

- There are some minimum starting conditions required for successful introduction of a mandatory accumulation system. At an absolute minimum, there should be regular auctions of government bonds with maturities in excess of one year and at least 2-3 stable banks that are fully compliant with international accounting standards, are financially sound, and have audited financial statements
- The government should collect and allocate all contributions. It is inefficient to have each pension fund responsible for collecting its own contributions.
- I don't like contingent budget liabilities for financing minimum pensions. The liabilities will not be properly recognized, the contingent liabilities are most likely to be triggered during bad economic times, and if the minimum benefit guarantee payments are needed, it will likely be needed for a very large group of pensioners at the same time.

7. Conclusion

The current pension system fails to meet any of the criteria for an effective pension system:

- Benefits are inadequate for all but the lowest paid workers
- Contributions are too high in relation to benefits received
- The design encourages employers and workers to evade
- The fiscal outlook in the short-term is favorable but in the long-term it is bleak.

Any effective reform must:

- Provide fair and adequate replacement ratios for all
- Be fiscally sustainable
- Encourage voluntary compliance
- Have the infrastructure to support it.

This report presented two design alternatives that help to correct these problems and are consistent with current law and the government's concept paper for pension reform. Certainly these are not the only possible pension reform alternatives. However, these proposals illustrate the types of design changes necessary to solve the current system's problems. Both proposals effectively address the first three problems identified above. However, neither solves the long-term fiscal deficit problem. Nonetheless, I think either is a viable alternative and a step in the right direction.

There are several scenarios that would allow Armenia to grow out of these fiscal problems. These include continued economic growth, rapid increases in the average wage, and reduced evasion due to improvements in plan design and completion of the personification program. These could all help reduce or eliminate these impending deficits.

If none of these prove sufficient, then the government of Armenia has other more stringent options available to restore fiscal balance. These include:

- Raising the retirement age slowly over time
- Eliminating the right to retire one year early after 35 years of service without benefit reduction
- Moving from wage to inflation indexing
- Increasing contributions
- Decreasing benefits
- Moving the base benefit to the budget.

The government of Armenia must now draft a detailed strategy paper outlining its specific pension system reform proposal and identifying the time frame, activities and responsibilities of all parties during the implementation process. In order to move forward, I suggest the government of Armenia:

- Review this report carefully

- Narrow the range of design options under consideration
- Develop a list of additional options to be analyzed
- Select a plan design and the write strategy paper

I look forward to assisting Armenia with its continued deliberations and analysis of alternative design options.

Appendix 1
Plan Comparisons

The table below summarizes the current plan and two proposed design options discussed in this report. It also describes the manner in which each plan was coded in the PROST mode.

	Current Plan	Notional Accounts	Mandatory Accumulation
Contributions to SSIF (Solidarity system)			
Employer	5,000 dram + 15% of pay between 20,000 and 100,000 dram plus 5% of pay in excess of 100,000 dram (amounts and limits assumed to be indexed in the future to keep contribution a constant % of the wage fund)	9000 dram (indexed to wages). Finances Base and Supplemental benefits only.	9000 dram (indexed to wages). Finances Base and Supplemental benefits only.
Employee	3% of salary	12% of salary between 50% and 250% of national average wage. Finances notional account benefit only.	None
Contributions to Accumulation System			
Employer	None	None	None
Employee	None	None	12% of salary between 50% and 250% of national average wage
Old-Age Benefits			
Base	4,000 dram, increasing to 5,000 by 2008	4000 dram (indexed to wages)	4000 dram (indexed to wages)
Supplemental	160 dram, increasing to 240 dram by 2008	250 dram (indexed to wages)	250 dram (indexed to wages)
Notional Accounts	None	Notional account balance from employee contributions indexed to increase in national average wage each year, and converted to an annuity by dividing by life expectancy factor at retirement age	None
Accumulation	None	None	Account Balance from required employee contributions. Used to purchase an annuity from an insurance company
Pension Indexing	Benefits for existing pensioners recalculated whenever benefit formula is changed (roughly equivalent to wage indexing)	One-time benefit increase in 2006 for existing pensioners to replacement ratio of 25% Base and Supplemental benefits for existing pensioners recalculated whenever benefit	One-time benefit increase in 2006 for existing pensioners to replacement ratio of 25% Benefits for existing pensioners recalculated whenever benefit formula is changed

	Current Plan	Notional Accounts	Mandatory Accumulation
		formula is changed (roughly equivalent to wage indexing) Notional accounts indexed to inflation	(roughly equivalent to wage indexing) Accumulation system indexing depends on type of annuity purchased
Disability	Benefits based on accrued benefit at time of retirement. Benefits provided for wide range of disabilities (Groups 1, 2, and 3)	Benefits based on projected benefit at time of retirement. Benefits paid for total and permanent disability only	Benefits based on projected benefit at time of retirement. Benefits paid for total and permanent disability only
Survivor	Benefits based on accrued benefit at time of retirement.	Benefits based on projected benefit at time of retirement.	Benefits based on projected benefit at time of retirement.

Appendix 2
PROST Method and Assumptions

Base Year: 2004. This year was selected because this is the most recent year for which data is available and because of the large number of changes made to the pension system during the past few years.

Projection period: 75 years

Population Projections
Population: Starting point is de facto population from the most recent census. This was treated as the correct population for 2002, and was projected forward to 2004 using PROST and then input as the starting population in the model.

Mortality: Actual mortality by age and sex was available for 2002. However, the life years of exposure were not sufficient for the individual age/sex data to be statistically reliable. Consequently, I started with RA-2000 mortality rates from the US. I applied these rates to the Armenian population data from the 2002 census to calculate expected number of deaths in 2002. I then compared this with actual number of deaths in 2002. The RA-2000 mortality rates were then increased separately for males and females by the ratio of actual to expected deaths. I then kept these mortality rates the same for a period of 10 years and decreased the rates to 150% of the RA-2000 rates over a further period of 30 years and then kept the rates the same for the balance of the analysis period. This resulted in an increased in life expectancy of about three years at retirement age. This method assumes the "shape" of the mortality curve is similar to the shape for the US. This assumption should be further examined. [See spreadsheet "Mortality" in the PROST input file]

Fertility: I used the 2002 census and 2002 births by age of mother to calculate fertility rates. I then assumed fertility rates would slowly increase and would eventually reach the same level as in the Soviet period, about 2.1 children per mother. The distribution by age of the mother was assumed to remain the same. In reality, the average age at birth will probably increase [See spreadsheet "Fertility" in the PROST input file]

Migration: The number immigrating and emigrating by age and sex was taken from actual statistics for 2002. Lacking other information, I assumed the same number immigrated and emigrated in 2004 as in 2002. The net emigration was very small. I assumed net emigration decreased to zero over a period of 10 years. [See spreadsheet "Migration" in the PROST input file]

Labor Force, Number Employed and Number Contributing
Labor Force Participation: I started with the rates from prior analysis as of October 2001. I then increased or decreased those rates by a constant percentage so that the total labor force matched government statistics [See spreadsheet "Macro Statistics" in workbook "Pension System Information and Statistics"]

Unemployment: After change the labor force participation rate to match the number economically active, I then took the unemployment rates from the October 2001 analysis and increased or decreased those by a constant percentage to match the government statistics for employed by age and sex [See spreadsheet "Macro Statistics" in workbook "Pension System Information and Statistics"]

Number of Nominal Contributors (Employed): In PROST, the number in this column should be the number theoretically employed and receiving service credit. Consequently, it is actually the number employed rather than the number contributing. The number employed is calculated for each age and sex cell using the formula, Employed = Population * Labor Force Participation * (1- Unemployment).

Nominal contributors as % of population: This rate is assumed to stay constant throughout the analysis period, except it is adjusted for women to reflect the increase in retirement ages between now and 2011. The formula is, Contributors as % of population = Labor Force Participation * (1- Unemployment)

Effective number of contributors: This is the number actually making contributions to the pension system. The total number came from information provided by the Social Insurance Fund (SSIF). Note

that the value for many factors differs from one report to the next from SSIF. Each number had to be tested for reasonableness and believability. The starting number of contributors was estimated by taking employee contributions and dividing by 0.03 to estimate the wage fund. The wage fund was then divided by the estimated average wage to determine the approximate number of contributors.

Exemption rate: This is the percentage of those employed who are not contributing, either because they are not required to contribute by law or because of evasion. In Armenia, individual farmers are not required to contribute and receive a social pension from the budget only. There are approximately 338,500 farmers, based on information from the SSIF. The remainder of the difference between the theoretical number of contributors and actual contributors is due to evasion. I set the percentage the same for all age and sex cells. This is undoubtedly incorrect. Data from the personified database will be needed to improve the accuracy of this assumption.

Revenue Calculation

Contribution From Employers and Employees (as % of wages): Based on an assumed distribution of contributors by wage groups. Since no wage distribution data is available for Armenia, data from Ukraine was used as a proxy. For each group, I calculated a contribution rate. Then I used a weighted average rate as input to the PROST model. [See spreadsheet "Pay Distribution and Contrib" in the workbook "Contribution and RR Calculations"]

Average wage: From government of Armenia statistics

Collection Rate: This is the ratio of the contributions actually collected from those who are contributing compared to the amount that should be collected. It reflects payment of contributions on less than the true salary. In many cases, employers contribute on a lower wage for each worker rather than on that worker's actual pay. The design of the pension system encourages this behavior because the worker receives the same benefit regardless of the amount of salary on which contributions are paid. I backed into this number to balance to actual SSIF 2004 financial statements and budgeted revenue for 2005.

Other income as a percent of employer and employee contributions: This factor is calculated from the SSIF 2005 budget. It accounts for contributions from the self-employed. Agricultural workers are no longer required to contribute. [See spreadsheet "SIF P&L History" in workbook "Pension System Information and Statistics"].

Number of Pensioners

Number of old age, disabled and survivor pensioners: Total count is taken from a SSIF report. Number of privileged pensioners is spread over period from standard retirement age minus 5 to end of mortality table (age 100) as a level % of the population. Based on the October 2001 study, the number of female privileged pensioners is assumed to be twice the number of male privileged pensioners. The overall split between males and females is also based on the October 2001 study. The number of regular old-age pensioners spread over period from standard retirement age to 100 as a level % of the population. Disabled pensioners spread from age 18 to 100 as a level % of the population. Survivors spread in two groups as a level % of the population – the first group is from 0-17 and the second from 58 to 100. The ratio of the first survivor group to the second was taken from the October 2001 analysis. Note that the counts shown in the SSIF report are likely too high. However, the initial benefit payment amount will be correct, because it is input. The future number of pensioners will depend on the difference in count between the beginning and end of the year, so the overstatement of new pensioners should be only slightly high. [See spreadsheet "Benefit Payments 2004" in workbook "Pension System Information and Statistics"]

Old age, disabled and survivor pensioners as a % of the population: Divide the initial number by age and sex by population. For males, the percent stays the same. For females, it is adjusted between 2004 and 2011 to reflect the increase in retirement age from 60 to 63.

Expenditures

Amount of pension for current pensioners: The total amount of payments to old-age, privileged, disability pensioners and survivors was take from the 2004 financial statements of the SSIF and the budged payment amount for 2005. The total was split between the various groups based on the

percentage split shown in the SIF financial statements for 2004. The split between males and females is based a report from SSIF as of July 1, 2005. [See spreadsheets "Pensioner Info" in the workbook "Statistics from GOA" and "SIF P&L History" in workbook "Pension System Information and Statistics"]

Replacement Ratios: Calculated by using the assumed wage distribution from Ukraine. For each wage group, the benefit payable and replacement ratio was calculated assuming 35 years of service at retirement. Then a weighted average replacement ratio was calculated and used as input to the PROST model

Pension indexing: Every time the Base and Supplemental benefit factors are increased, benefits for existing pensioners are recalculated. In general, the increases in these factors are designed to keep the average replacement ratio constant as the average wage increases. Consequently, this is functionally equivalent to wage indexing. For 2006-2008, agreed-upon benefit increases are expected to keep the replacement ratio constant. In 2006, the benefit formula for new pensioners is expected to be changed to produce an average 25% replacement ratio. At the same time, benefits for existing pensioners will be increased by the same amount. A special indexing factor was used for 2006 to reflect this benefit improvement.

Retirement Age: The retirement age in PROST is lower than the standard retirement age for both men and women. This is because privileged pensioners retire earlier than standard old-age pensioners and because those with 35 or more years of service are permitted to retire one year early. Retirement ages are set equal to standard age less one for both men and women. The standard retirement age for women is scheduled to increase from 60 to 63 by 2011

Administrative Expenses: A load factor for administrative expenses is calculated from the 2004 SSIF financial statements. This includes expenses for the SSIF staff as well as postal expenses for delivery of pensions. Note that this factor is coded in PROST as a percentage of employer and employee contributions and not as a percent of pension payments. [See spreadsheet "SIF P&L History" in workbook "Pension System Information and Statistics"]

Other expenses: This is also a load factor and is used to account for state employment and state social insurance benefits, which are financed from SSIF revenues. It is a percent of pension payments. [See spreadsheet "SIF P&L History" in workbook "Pension System Information and Statistics"]