COMPREHENSIVE ANALYSIS OF THE CURRENT ARMENIAN PENSION SYSTEM AND RECOMMENDATIONS FOR ITS IMPROVEMENT

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I. INTRODUCTION

At the invitation of AED and USAID/Armenia, I visited Yerevan from June 26 to July 2, 2005. The purpose of my visit, as outlined in the Scope of Work was to:

- Perform an actuarial analysis of the current status of pension system in Armenia;
- Considering a multi-pillar system, advise the pension working group on those population categories (age groups) for whom involvement in the new system should be mandatory, for whom it should be voluntary, and for whom there would be no involvement at all;
- Advise on the theoretical payment rates, given the different population categories, for the accumulated and PAYG systems;
- Outline the process to do models and simulations aimed at resolving transition period financing issues [no. of models and simulations TBD upon consultant's arrival in country];
- Develop possible transition scenarios and conduct mathematical simulations in order to identify the value of pension accumulated in past by those who transfer to the new system, the value of pension to be paid to those who remained in the old system and the new funding sources;
- Do rough estimations of the cost of reforms that would be required by the new models, i.e. prepare analysis for one scenario and train NORK staff how to analyze scenarios on their own; and
- Develop the capacity of those who are responsible for policy development and implementation, conduct on-the-job training of staff in the design of pension models system based on estimation-analysis-forecast.

This report presents the results of my findings and my recommendations for future interventions to assist the government of Armenia with the reform of their pension system. I have organized this report differently than the 7 points shown above, but all of those issues are addressed to some extent.

As part of my work in building a model of the current pension system, I have explained to Nork Center staff in detail the methods and assumptions I used to develop the model. However, I want to point out that it isn't reasonable to expect "actuaries" with minimal formal training, who have never worked regularly under the guidance of an experienced senior actuary, and who have not written and passed actuarial examinations given by the any country with an internationally recognized exam program to prepare actuarial analysis for major plan design changes. They can reasonably be expected to prepare analysis for minor changes to an existing program. In my opinion, an expatriate pension actuary with significant experience in developing economies will need to continue to assist Nork Center staff with the analysis of plan redesign options.

II. PROBLEMS WITH THE CURRENT PENSION SYSTEM

The first step in any pension reform is always to improve the current pension system so it serves as a solid foundation for a future multi-pillar system. A good pension system should meet the following conditions:

- *Adequate benefits to prevent poverty among the elderly* following their retirement from the work force. Benefits should ideally be sufficient, together with personal savings and occupational schemes, to allow the worker to maintain the same standard of living after retirement as before. The ILO standard is that benefits for workers with 30 years or more of service should be at least 40% of pay at retirement. The ratio of the pension benefit to the salary at the moment of retirement is referred to as the replacement ratio
- *Fiscally sustainable* both in the short and long-run. The pension system must remain despite an increasing number of pensioners relative to contributors, decreasing birth rates, and increasing life expectancy. Typically, projections are prepared over a period of 75 years to determine long-term sustainability
- *Individual equity* – benefits must be fair in relation to the required contributions. Any system can be made fiscally sustainable if the benefits are low enough or the contributions are high enough.
- *Encourage voluntary compliance.* The design of the pension system should encourage workers and/or their employers to contribute for all workers and on the worker's full salary.

In my opinion, the current solidarity system in Armenia meets none of these goals and objectives. Consequently, the first responsibility of the government is to improve the design and administration of the current pension system before considering the addition of a fully funded pillar. If the foundation of the pension system is weak, any pension system redesign will likely fail.

Inadequate pensions

Most workers in the Armenian pension system receive inadequate pension benefits at retirement. Only those earning between 13,000 dram (the minimum wage) and 20,000 dram (50% of the average wage) arguably receive adequate pension benefits. As pay increases, benefits at retirement grow increasingly inadequate.

The table below shows projected replacement ratios at different salary levels for workers retiring at the standard retirement age in 2005 with 30 years of service.

Salary	Percent of Average Pay	Replacement Ratio
22,932	50%	40.46%
45,864	100%	20.23%
68,796	150%	13.49%
91,728	200%	10.12%
137,592	300%	6.74%

As can be seen, those earning the average wage have a replacement ratio of about 20% while a worker earning three times the average wage has a replacement ratio of less than

7%. Such a system is unlikely to meet even the minimum goal of preventing poverty following retirement and is grossly unfair to those making more than 50% of the national average wage.

Fiscally unsustainable

I prepared a detailed actuarial projection of the current pension system using the World Bank's PROST model. The assumptions and methods used for these projections are shown in the Appendix to this report. According to my analysis, the system will start running deficits in 2021 and will be totally bankrupt by 2026, despite the high contribution rate and low benefits.

Armenia is fortunate that it has a relatively young population today and that the number of new pensioners in the next 15 years will be very low. Those Armenians reaching retirement age today were born during World War II. Since the birth rate during and right after the war was very low, there are a small number of new pensioners in the next 10-15 years. Conversely, the birth rate in Armenia was quite high during the 1960's and 1970's, but then dropped sharply following independence. As a result, the number of workers is higher now than it will be in the future.

The table below summarizes some key statistics regarding the projections I prepared for the current pension system.

	2005	2010	2020	2040	2060
Population					
0-14	658	565	601	528	527
15-RA	1,933	2,114	2,093	1,998	1,649
Over RA	431	390	487	688	913
Population Dependency Ratio	22.3%	18.4%	23.3%	34.4%	55.4%
System Dependency Ratio					
Contributors	481.0	528.8	573.2	550.4	456.0
Beneficiaries	480.4	432.1	488.9	676.0	868.3
Ratio	99.9%	81.8%	85.3%	122.8%	190.4%
Finances					
Total Revenue – amount	54.3	92.5	204.6	616.1	1,665.0
as % GDP	2.6%	2.9%	3.3%	3.0%	2.5%
Total Expenditures -- amount	54.9	81.0	197.0	917.0	3,867.3
as % GDP	2.7%	2.5%	3.1%	4.5%	5.8%
Surplus/Deficit -- amount	(0.6)	11.5	7.7	(301.0)	(2,202.3)
as % GDP	(0.0%)	0.4%	0.1%	(1.5%)	(3.3%)

Several items in this summary are noteworthy:

- The number of contributors today is far less than it ideally should be. According to statistics from the government of Armenia, the total number employed in the formal and informal sectors combined is about 1.1 million. There are

approximately 330,000 farmers who are not required to contribute to the solidarity system. They receive a social pension from the budget. This leave 770,000 that should be contributing to the Social Insurance Fund (SIF). However, only about 480,000 are actually contributing. About 38% of all workers are evading

- Today there is one contributor for each beneficiary. While this ratio – known as the system dependency ratio – will improve during the next few years, by 2040, the number of beneficiaries significantly exceeds the number of contributors. By contrast, note the population dependency ratio. This is the ratio of the population older than retirement age to the population of working age (defined internationally as ages 15 to retirement age). This ratio shows the same trends as the system dependency ratio, but is vastly lower. This shows that a significant portion of the working population is either unemployed, not required to contribute or evading, and that the number of beneficiaries is higher than it should be due to privileged and long-service pensions and the ease with which disability pensions are awarded
- Despite all the poor design elements, the system is expected to show a surplus from now through 2020. Thereafter, the situation quickly reverses. The system is expected to have deficits every year from 2021 through 2079, the end of the 75-year analysis period. All accumulated surpluses will be completely exhausted by 2026 and the system will be effectively bankrupt. This is true despite the high contribution rates and the low benefits paid.

It is important to note that while the projections from the model are accurate, much needed data to further improve the model is not available. In particular, personified information for workers and pensioners by age, sex and salary is needed. The government of Armenia needs national electronic databases for both workers and pensioners that can easily be queried and can quickly produce any required reports and analysis.

Inequitable benefits in relation to contributions paid

Individual equity is measured by calculating the "rate of return" that participants are expected to earn on their contributions to the solidarity system. The rate of return is calculated by first projecting the expected contributions to the pension system during the participant's working career. Then the benefits expected to be received following retirement are calculated. Finally, the rate of return is equal to the interest rate that makes the present value of the contributions and benefits equal. The calculations require sophisticated financial and actuarial calculations. The real rate of return should be greater than zero for workers at all salary levels. This calculation shows the extent to which participants are getting a "good deal".

In Armenia's case, as has already been noted several times, contribution rates are high and benefits are low, particularly for the higher paid. One of the reasons for the high level of non-compliance in the Armenian pension system is that even though Armenian workers can't calculate the rate of return themselves, they know they are not getting good value for their money. The table below shows the rate of return earned by participants at different salary levels.

Real Rate of Return for Workers Contributing for 35 Years and Retiring at Age 63

Percent of National Average Wage	Contribution Percent	Replacement Ratio	Real Rate of Return
50%	23.9%	46.7%	+1.9%
100%	19.4%	23.4%	-0.7%
150%	17.9%	15.6%	-2.2%
200%	17.2%	11.7%	-3.3%
300%	13.7%	7.8%	-4.8%

This table shows that only those earning 50% of the national average wage are earning a positive real rate of return on their contributions to SIF. All others are being forced to contribute to a system that each year gives them back less than what they contribute.

Strong incentives to evade or pay less than the amount due

The current Armenian system contains numerous disincentives to comply with the law regarding pension contributions.

- Contributions are a percentage of pay, but the benefit formula is not based on pay. All workers with the same number of years of service at retirement get the same pension benefit in dram regardless of salary. Yet the higher paid make vastly higher contributions than the lower paid. This encourages employers to make contributions on the minimum wage rather than the actual wage for everyone. Workers will not complain to their employers, because the pension benefit is not affected at all.
- Employers and workers are encouraged to evade because they know they are getting completely inadequate benefits in relation to contributions. Consequently, workers would be happy to cooperate with their employers and receive extra pay in lieu of contributions to the pension system
- The benefit level goes up very little with increased years of service. The table below shows retirement benefit in 2005 as a function of years of contributions. As can be seen, someone who contributes for 15 years receives 5,440 at retirement, while someone who never contributes at all receives 4,000 dram per month. Fifteen years of contributions results in a pension increase of just 1,440 dram.

Years of Service	Base Benefit	Suppl. Benefit	Total Benefit	Estimated 2005 Average Wage	Replacement Ratio
0	4,000	-	4,000	45,864	8.72%
5	4,000	160	4,160	45,864	9.07%
10	4,000	640	4,640	45,864	10.12%
15	4,000	1,440	5,440	45,864	11.86%
20	4,000	2,560	6,560	45,864	14.30%
25	4,000	4,000	8,000	45,864	17.44%
30	4,000	5,280	9,280	45,864	20.23%
35	4,000	6,720	10,720	45,864	23.37%
40	4,000	8,320	12,320	45,864	26.86%

III. POSSIBLE SOLUTIONS

Potential solutions fall into two general categories – improving voluntary compliance and enforcement and properly allocating costs among SIF, employers, and the state budget.

Solutions in the first category change the solidarity system to make it fair to all who are required to participate, thereby encouraging voluntary compliance. For those who fail to voluntarily comply, there must be effective enforcement.

The second set of solutions assures that all who make contributions are treated equally; the same eligibility rules and benefit provisions apply to everyone. It also assures that revenue from worker's contributions is used solely to provide benefits to those who contribute and meet eligibility conditions. The revenues should not be used to support other government social programs.

<u>Improving voluntary compliance and enforcement</u>

- *Make benefit formula more equitable for workers at all salary levels*: If benefits will be the same for everyone with the same number of years of service, regardless of salary, then contributions must also be the same regardless of salary. Alternatively, both benefits and contributions can be related to pay so that those who earn and pay more also receive more. The current arrangement assures that workers and employers will either try to evade completely and just accept a social pension or will pay on the minimum wage rather than actual earnings.
- *Introduce a wage cap*: Virtually all solidarity systems have a wage cap – a limit on the maximum salary for calculating both contributions and benefits. Typically, the limit is between 1.5 to 3 times the national average wage. The purpose is to prevent the very high paid from having to pay exorbitant contributions and to limit the size of the benefits paid to the very highly paid as well. Those with very high salaries have the ability to save for their own retirement, so there is no need to pay excessively high benefits from the solidarity system
- *Tie benefits more closely to contributions*: There must be an obvious link between the amount of benefits received and the amount of contributions paid.

This means that the higher paid should get greater benefits in drams, and the same or slightly lower benefits as a replacement ratio. Some benefit formulas, such as so-called notional accounts, make the benefit a direct function of the contributions paid to the system to emphasize the link between contributions and benefits and encourage voluntary compliance

- *Complete the personification program*: It is vital to have individual records of work history and salary for each worker's entire career. This is important for a solidarity system, but is absolutely essential for a fully funded system or a solidarity system with notional accounts. Even for a pure solidarity system, data and contributions should be collected and verified more frequently than once per year. Experience has shown that when life-by-life data is collected on a monthly basis, it becomes much harder to evade or under-pay. With a good personified data base, it's also possible to calculate solidarity system benefits on average pay over a worker's entire career and to allow workers to regularly check that the solidarity system's historical records are accurate. The whole system will have greater transparency and efficiency.
- *Improve enforcement:* Voluntary compliance is preferable, but any government must have the ability to effectively enforce its own laws. Enforcement of payroll contribution compliance encompasses three distinct areas – making sure all employers who are required to contribute are registered, assuring that contributions are made on behalf of all employees of the employer, and assuring that the employer pays the correct amount of contributions on behalf of each employee. Each of these three areas must be addressed to have an effective contribution collection system.

<u>Proper allocation of costs between SIF, budget and employers</u>

It is important to clearly separate social insurance from social welfare programs. Social welfare payments are generally made from the budget and are means-tested. They are intended only for the poorest members of society. Social insurance programs are insurance schemes that provide benefits only to those who make contributions and meet specified eligibility conditions, and the same conditions are applied to all members. Receipt of benefits is not based on need, but rather on making required contributions. Currently, there are a variety of payments being made from the SIF that shouldn't be paid from the solidarity system.

I recommend the following changes be considered:

- *Move state employment and social insurance costs to the budget*. Currently these payments are financed from payroll contributions. Since these are social welfare payments, they should be budget financed.
- *Remove financing of privileged pensions from SIF*. There is no question that workers in certain professions need to retire early. The question is how these early retirement benefits should be financed. Currently those eligible for privileged pensions make contributions for fewer years than other workers, retire

earlier, and potentially receive payments for a longer period of time. This violates the basic principle that everyone who makes the same contributions should be entitled to the same benefits. Currently, ordinary pensioners are subsidizing benefits for privileged pensioners. Either benefits prior to the standard retirement age should be financed by employers or those entitled to privileged pensions should pay an appropriately higher contribution rate

- *Set up a separate employer-funded occupational disability scheme outside the solidarity system*. Normally occupational disabilities are financed through a separate occupational disability program. The reason is that the incidence of occupational disability varies significantly by industry and by individual company within an industry. Normally each employer pays a different premium for occupational disability coverage that reflects the expected incidence of occupational disability for that particular employer. The system is usually designed to reward those employers who improve workplace safety with lower premiums. Currently employers in low risk industries or companies are subsidizing those in high-risk industries or those with poor safety records
- *Finance only total and permanent disability from SIF*. Normally temporary disability pensions are either paid by the employer or through a separate insurance fund. SIF should provide pension benefits only for those who are no longer able to work either due to old-age or permanent disability. Normally only those disabilities that are expected to be permanent or to result in death are paid from a solidarity pension system.
- *Move the Base Benefit to the budget*. It can be argued that the 4,000 dram Base Benefit is really a social welfare benefit. It is not based on work history at all. Everyone receives the same Base Benefit whether they never worked or worked for 40 years. The only difference today is the source of payment. Those with less than 5 years of work history receive the benefit from the budget, while those with more receive it from SIF. Flat benefits like this one are often paid from the budget, and in some countries, it is means tested. Pension benefits that are paid from the budget and are intended to prevent poverty are often referred to as "pillar zero benefits."

An argument can be made that none of the items listed above truly reduce total costs. They just move the payments from one pocket to another. However, they do impact the overall equity and fairness of the solidarity pension scheme. Rearranging the source of benefit payments improves the solidarity system by providing equivalent benefits to all members, removing benefits that are not truly pension benefits, and paying benefits only for those who make contributions.

IV. FULLY FUNDED PENSION SYSTEMS

First and foremost, Armenia must decide whether it wants or needs to have a fully funded pillar. Armenia can have an effective and affordable pension system without introducing a fully funded pillar. That said, one of the reasonable options available to Armenia is to introduce, over time, a true multi-pillar system.

Should Armenia decide to introduce a fully funded pillar, it will have a different design, characteristics and challenges than other similar systems introduced in the region during the past 7 years, for the reasons discussed below.

Supplement to, not replacement for, the current system
In most cases, the purpose of introducing the fully funded system is to significantly decrease excessively high benefits and contributions to the existing solidarity system, and then supplement the down-sized solidarity system with a fully funded system. In the process:

- Total contributions to the solidarity and fully funded systems combined are usually kept the same as the contribution that was originally paid just to the solidarity system.
- Money is diverted away from the solidarity system to finance the fully funded system.
- Benefits in the solidarity system are reduced more than revenue. In the long-run, this brings the solidarity system back into fiscal balance. However, in the short-run a significant deficit is created (often referred to as a transition cost) that must be financed from other revenue sources, which include the State budget, privatization proceeds, and reductions in spending on other programs.

In many cases, older workers are prohibited from participating in the multi-pillar system there isn't time to earn significant benefits from the fully funded system. Middle-aged workers may be given an option to join the multi-pillar system or they may be forced to join. Younger workers are generally forced to join the new system, though in some countries, only workers hired after date of enactment of the new legislation are required to join. The number joining and the percent of contributions diverted to the fully funded system determine the size of the transition cost. Often one factor or the other must be adjusted so the total transition cost is not greater than what can be afforded.

Armenia's case is quite different than the standard one described above for the following reasons:

- Assuming Armenia wants to keep its solidarity system, it would be pointless to reduce benefits as they are already too low. If SIF were to be eliminated completely, then the Base Benefit, disability pensions and survivor pensions would all have to be paid from the budget and a fully funded system would be established to supplement the Base Benefit. Another organization would then have to assume responsibility for maintaining the personified data base and making payments to pensioners. I do not recommend this approach
- Armenia needs to increase total replacement ratios, not decrease them. Either solidarity system benefits should be increased or solidarity system benefits should remain the same (with significant restructuring to improve overall equity) and these benefits should be supplemented by a fully funded system so the total replacement ratio from the two components of the pension system is at least 40%

- It would be pointless to exclude any existing workers from the new system. Those who participate in both systems will have higher replacement ratios than those who are just in solidarity since solidarity benefits are would not be reduced for those joining the multi-pillar system
- There might not be any transition cost. If contributions to solidarity were diverted to the fully funded system without reducing solidarity system benefits, this would not solve the long-term financing problems of SIF; it would just make them even worse. To bring the solidarity system back into balance, benefits must be reduced more than contributions to restore long-term fiscal balance. If benefits will not be reduced, then contributions also cannot be reduced. Instead, the solidarity system must be changed to improve compliance and properly separate financing of benefits among the SIF, budget and employers. These savings would then be used to reduce solidarity system contributions while still restoring long-run fiscal balance. Until this is accomplished, the fully funded system would have to be financed by putting more money into the pension system. For this reason, the fully funded system shouldn't be introduced until all solidarity system problems have been corrected.

Another political issue for Armenia is how to introduce a fully funded system without violating the principle of social justice that has guided pension policy since independence.

Once a multi-pillar system is introduced, new pensioners will receive higher benefits than existing pensioners because they will get benefits from both solidarity and the fully funded systems. The government of Armenia could justify this by having workers finance the fully funded system with contributions taken from their own pay, while solidarity is fully financed by only employer contributions. Then an argument can be made that employers are financing the same benefit for current pensioners and new pensioners, while the additional benefit from the fully funded system is financed entirely by the employee from his or her own pay.

One possible strategy, after reforming the solidarity system, would be to move the 3% contribution already made by employees to the fully funded system. This would make the solidarity system fully employer financed, and would reduce the impact of fully funded system introduction on worker's take-home pay. For example, if the contribution rate to the fully funded system was 5%, worker's pay would go down by only 2% (5% required contribution less the 3% contribution already made to SIF by workers) instead of the full 5%.

Contribution rate required for certain target replacement ratios

The theoretical contribution rate to the fully funded system depends on the desired target replacement rate from that system. The table below shows the estimated contribution rate required for a 30-year period to finance various target replacement ratios.

Target replacement ratio	With level payments	With inflation indexing

Target replacement ratio	With level payments	With inflation indexing
10%	2.33%	2.97%
15%	3.50%	4.46%
20%	4.66%	5.94%
25%	5.83%	7.43%
30%	7.00%	8.92%
40%	9.32%	11.92%
50%	11.66%	14.86%

If the government wanted a 15% target replacement ratio from the fully funded system, for example, workers would need to contribute 3.5% of pay to finance a level annuity following retirement or 4.46% to finance an inflation-indexed annuity. This is based on 30 years of contributions. If the standard working career were defined as 35 years, for example, then the required contributions would be lower.

Transition costs (if any)

If no money is diverted from the existing solidarity system to the fully funded system, then there will be no transition costs. If solidarity contributions are reduced and transferred to the fully funded system, but benefits are not reduced and compliance is not improved, then projected deficits will increase in all years and the system will be in even worse financial condition than before the introduction of the multi-pillar system. In this case there is also no transition cost, just increased costs in all years. The transition cost in a well-designed reform must be temporary and fully financed in a period no longer than 10-15 years.

Implementation issues

If the government of Armenia decides to introduce a fully funded system, in addition to setting the contribution rate and determining the source of contributions, many other decisions will have to be made and incorporated into the legislation establishing the fully funded system. This includes:

- *Government regulator for the new system* – will it be a new organization or an additional responsibility of an existing organization?
- *Contribution collection* – who will collect contributions for the fully funded system and transfer them to the private pension companies?
- *Investment limits* – what type of investments will be permitted and how will limits be assets class be established? What portion of investments can be made overseas?

- *Investment managers* – Who will manage the fully funded system assets and what qualification requirements will there be? How will the investment manager be selected?
- *Administrative services* – Who will provide marketing, enrollment, accounting, recordkeeping, compliance and other services?
- *Individual account recordkeeping* – who will keep track of individual account balances, how frequently will the accounts be updated, will unit, cash, or share accounting be used, what will the asset valuation rules be?
- *Custodian* – will there be a custodian? Who can provide custodial services? What will be the specific responsibilities of the custodian?
- *Regulations* – a large number of implementing regulations must be drafted, reviewed and published

Because of the significant time, resources and expenses needed to establish the infrastructure to support the new system it is foolish to establish a second pillar with a low contribution rate. The fully funded system contribution rate should be in the 5 to 10% range, or else it is better not to have a second pillar.

V. NOTIONAL DEFINED CONTRIBUTIONS

A full discussion of notional defined contribution plans is well beyond the scope of this report. At this moment, suffice it to say that current Armenian legislation anticipates and authorizes implementation of a notional defined contribution component in the current solidarity system. A notional defined contribution plan looks like a fully funded plan in many ways, but it is not:

- Individual accounts exist, but are normally not backed by any assets
- Notional accounts are merely a method of calculating benefits in a solidarity system; it is not a fully funded system
- "Interest" is credited on accounts, but it is based on a formula rather than on the actual rate of return on a portfolio of assets
- No money is directly invested in any financial instruments
- Recordkeeping is considerably simpler because there is no need to value assets and allocate actual investment income each day

Many government officials and workers do not really understand how notional account systems operate and the advantages and pitfalls. If Armenia wants to consider notional accounts, I recommend a series of seminars specifically targeted to this topic so policy makers fully understand the notional account system.

VI. STEPS IN THE REFORM PROCESS

I strongly recommend that the government of Armenia focus initially on deciding whether or not to establish a multi-pillar system in the near future, the role of each of the

pillars in providing retirement income, and the timing of the introduction of the fully funded system, if there will be one. Then it should spend the majority of its time on correcting the serious design flaws in its existing solidarity system and completing the personification project. The solidarity system will likely continue to be the foundation upon which the pension system rests. If it is weak, the entire reformed pension system is likely to have serious problems.

Below is an outline of the steps I recommend to redesign the pension system:

- Step 1: Baseline forecast of the current pension system. This should include replacement ratios for workers at different salary levels, internal rates of return for different cohorts of workers, and long-term projections of SIF finances. I completed this analysis during my visit and have summarized the results in this report
- Step 2: Establish the total replacement ratio target for the pension system as a whole. Determine whether it will be financed through social assistance, the solidarity system, a fully funded system, or some combination. Determine the portion of the total replacement ratio that should come from each selected component
- Step 3: Redesign the first pillar to correct the defects discussed in this report and achieve the target replacement ratio selected in step 2 for all groups of workers. Prepare new financial forecasts, replacement ratio projections and internal rate of return calculations for the reformed solidarity system
- Step 4: Complete and fully test the personification system. Move to electronic monthly or quarterly collection and reconciliation of data and contributions received. All employers must be registered with SIF, contributions must be collected from everyone in the labor force, and contributions must be based on the correct amount of pay. Solidarity system costs can be significantly reduced by proper contribution and data collection and reconciliation procedures
- Step 5: Estimate the required contribution rate for the portion of the target replacement ratio to be funded by the fully funded system (if any). Prepare 10-year projections of contributions and total assets in the fully funded system. Study the likely impact of the contribution flow on local capital markets. Establish a target for overseas investments and determine the likely impact on the local currency and the macro economy. Decide on the institutions that will be involved in administering and regulating the fully funded system and the specific responsibilities of each organization
- Step 6: Draft needed legislation and develop a detailed implementation plan to create the institutions, train staff, develop or purchase needed IT systems, etc. to support the new system. This should be actively managed by both political and working level committees and must be overseen by at least a deputy prime minister. Otherwise, disagreements among ministries and institutions will inevitably slow progress.

VII. POSSIBLE ADDITIONAL PROST ANALYSIS

In order to assist with the design discussion, some additional PROST analysis might be helpful. Possible additional analysis for the redesign of the solidarity system and measurement of potential transition costs might include the financial impact of:

- Transferring responsibility for financing state social insurance and employment benefits from SIF to the budget
- Introducing a wage cap for calculating required contributions and benefits from SIF
- Calculating an appropriate flat contribution in drams to finance SIF benefits
- Removing financing of privileged pensions from SIF
- Calculating the cost of Base and Supplemental benefits separately to determine the potential impact of moving some or all of the Base Benefit financing from SIF to the budget
- Removing the 3% employee contribution from the solidarity system and moving it to the fully funded system

VIII. CONCLUSION

The government of Armenia must decide on the appropriate target replacement ratios for its pension system and how it will be financed. Once this is determined, the government should focus its efforts on comprehensive reform of the existing solidarity system to correct the serious flaws identified in this report. It should also accelerate its administrative reforms, particularly introduction of personification, and improvements in compliance. Finally, it should set a realistic deadline for introducing a fully funded system (if there will be one). At least 2-3 years will be required to build the institutions necessary to support the new system.

In my opinion, it is not mandatory for Armenia to introduce a fully funded system now. In fact, the World Bank is seriously reconsidering its position on multi-pillar systems and the preconditions for their introduction. It is questionable whether Armenia is really ready for a fully funded system now. It's quite possible Armenia would be better off waiting 5 years or more to introduce such a system or not having a fully funded system at all.

Serious consideration should be given to the option of keeping the Base Benefit and financing an additional earnings-related benefit through notional accounts within the current solidarity system. It will provide many of the same benefits as a fully funded system without the need to worry about asset management and investment, and with much simpler administration. It can also be used as to transition to a true fully funded system in the future.

Regardless of its decision, the critical first step in the reform process is to reform the existing solidarity system first.

APPENDIX: PROST METHODS AND ASSUMPTIONS

This Appendix explains how the various required inputs to the PROST model were developed.

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"]

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"]

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"]

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 factor so that the total labor force matched government statistics [See spreadsheet "Macro 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 factor to match the government statistics for employed by age and sex [See spreadsheet "Macro 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 (SIF). Note that the value for many factors differs from one report to the next from SIF. Each number had to be tested for reasonableness and believability. In this instance, the number of contributors from this report seems to be approximately correct and was used. [See spreadsheet "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 330,000 farmers. 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): Comes from wage fund information from the SIF for the first 3 months of 2005. Note that the contribution % will drop as the average wage grows unless the 20,000 and 100,000 breakpoints are indexed in some way or the base amount is increased. This is the contribution percentage for employers only. Note that the actual contribution percentage varies with the contributor's wage and is therefore not constant for all employees. The distribution of contributors by wage will impact the average contribution percentage. Since wage distribution data is not available, an exact calculation is not possible. However, this number appears to be reasonable as it is somewhat higher than the contribution percentage for someone earning the average wage. The contribution percentage in the model is equal to the contribution percentage in the spreadsheet plus 3% for employee contributions [See spreadsheet "Wage Fund and Contrib 2005"]

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 the minimum 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 SIF 2004 financial statements.

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

Number of Pensioners

Number of old age, disabled and survivor pensioners: Total count is taken from an SIF 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 SIF 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"]

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 SIF. 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 on the October 2001 analysis. [See spreadsheets "Benefit Payments 2004" and "SIF P&L History"]

Replacement Ratios: Taken from SIF report on benefit payments for 2004. Replacement ratios were compared with the target replacement ratio for someone earning the average wage. The actual replacement ratio should exceed the replacement rate for someone earning the average wage since the lower paid get higher replacement rates than the higher paid. Depends on distribution of salary at moment of retirement since flat benefit formula produces lower replacement ratios for higher paid. Future replacement ratios are assumed to increase from 2006-2008 since the planned increases in the Base and Supplemental benefit factors will cause the average benefit to grow more rapidly than the average wage. [See spreadsheets "Benefit Payments 2004" and "Benefit Formula History"]

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, benefits are expected to grow by more than the average wage. Consequently, benefits for existing pensioners are effectively indexed in those years by more than 100% of the growth rate in the average wage.

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 SIF financial statements. This includes expenses for the SIF staff as well as post 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"]

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 SIF revenues. It is a percent of pension payments. [See spreadsheet "SIF P&L History"]