Pensions Inception Report

Introduction

1. The pension team from the WB will examine the current and future pension liabilities of the Government of Tanzania. Long term financial projections will be produced using the Pension Reform Options Simulation Toolkit (PROST) for five mainland pension funds: NSSF, PSPF, PPF, LAPF and GEPF. The list of data required from each pension fund is attached in Annex 1.

2. The study will analyse the financial sustainability of the pension system and future government obligations to finance it under a no-reform scenario as well as under a number of variants of harmonization of the system being currently considered by the Government and different options for merging the existing funds. In addition, the study will assess the effects of harmonization on the accrued pre1999 pension rights of PSPF members.

3. Based on the analysis, the study will identify the key issues and major risks facing the existing pension system and their potential impact on the broader economy and propose a set of broad approaches to address them for discussion with the Government. The study will focus on the issues related to financial sustainability and affordability of the pension system as well as adequacy of benefits, distributional effects and equity issues within the system. Comments on the legislative framework and guidelines for the pension industry will be based on a recent IMF study. Some regional success stories in managing pension’s liabilities and lessons learnt will be also presented, based on previous World Bank analysis and reports.

Timing

4. A draft report will be produced by mid-July 2014 and presented to the Government. Then a final report will be produced based on the feedback received. The work will be presented at the PER/GBS annual meeting towards the end of the year. The study will be completed in close collaboration with the consultants completing the PER contingent liabilities study.

PROST Methodology

5. The assessment of the government’s current and future pension liabilities will be carried out using the Pension Reform Options Simulation Toolkit (PROST). PROST is a proprietary computer-based toolkit developed by the World Bank to support the Bank’s pension policy dialogue in client countries. By design, it is generic, flexible and can be easily adapted to various country circumstances with the capability to model both defined benefit and defined contributions schemes. To date, it has been used in over 90 countries in various stages of development.

6. PROST uses a set of exogenous assumptions about key macroeconomic variables (mainly GDP growth and inflation), demographic projections (fertility, mortality and migration) as well as pension system policy and behavioral variables on a country specific basis to establish the environment for modeling pension systems. Assumptions for the baseline as well as other scenarios should be based on consultations with experts in the country economy.
Based on the assumptions, the model provides projections of coverage, benefits, system finances, potential government obligations and estimates various solvency measures across the projection period. PROST is a deterministic model, however uncertainty can be dealt with via sensitivity tests and “what if” (scenarios) approach. Sensitivity tests help analyze the sensitivity of outcomes to variations in the demographic and macroeconomic assumptions as well as main behavioral (contribution density, retirement pattern) and pension policy assumptions. The PROST model also allows to evaluate and compare pension reform options to promote informed policy making.

7. The PROST model uses birth year cohorts in the population estimates and is able to provide estimates of distributional outcomes within these cohorts and differences among cohorts for a variety of measures of a pension system’s outcomes. These include the average value of individual accounts and income replacements rates.

8. The model consists of an input workbook and five output modules. On the input side, the user provides country specific data on demographic, economic and pension system related parameters and assumptions about their behavior in the future. This information is entered in the **input file** with six embedded worksheets:

   **General**
   Economic variables (GDP and wage growth, inflation, interest rate), non-age-specific pension system parameters (pension fund balance and benefit expenditure in the base year, retirement age, contribution rate, pension indexation rules, etc.) and some demographic variables;

   **Population**
   Base year population by age and gender along with age-specific fertility and mortality rates and immigration information.

   **Labor**
   Age and gender specific labor force participation and unemployment rates as well as distribution of wages and old age pensions across age and gender cohorts.

   **Pension**
   Age and gender specific information about pension system contributors, beneficiaries, coverage and retirement rates, average years of service at retirement and replacement rates for new beneficiaries.

   **Profiles**
   Information on representative individuals, such as gender, career path, individual wages, life expectancy, etc.

   **Reform**
   Parameters relevant to systemic reforms to be simulated (any combination of conventional PAYG, fully funded DC and notional DC pillars), including switching pattern, how the acquired rights will be paid, contribution rates, rules for annuitization and pension payout under DC schemes and replacement rates/benefit formula in a PAYG pillar, indexation, etc.
9. In the most simplified way the **general calculation scheme** can be summarized in the figure below.

10. PROST follows single age/gender cohorts over time and generates population projections, which, combined with labor market assumptions, are used to forecast future numbers of contributors and beneficiaries. These in turn generate flows of revenues and expenditure. The model then projects fiscal balances and calculates the implicit pension debt. The required contribution rates and affordable replacement rates for zero pension fund balance in each year of the simulation period are also calculated. Finally, PROST produces outputs related to individuals – what an individual would contribute to the system and what he/she obtain under PAYG DB and multi-pillar schemes. This allows both intra- and intergenerational analysis.

11. Depending on the characteristics of the pension system and data availability, the user can choose the method for calculation of some of the variables. In particular, the number of contributors and beneficiaries can be computed in either “Stock” or “Flow” method. With the “Stock” method, for each year the stocks of contributors/beneficiaries are calculated first and then inflows (new contributors/beneficiaries) are derived as the changes of the stocks:

\[
\text{Inflow}(a,t,g) = \text{stock}(a,t,g) - \text{stock}(a-1,t-1,g) + \text{outflow}(a,t,g),
\]

With the “Flow” method, inflows are calculated first and then stocks are derived as previous year’s stocks in each age/gender cohort adjusted for the net inflow (inflow-outflow):

\[
\text{Stock}(a,t,g) = \text{stock}(a-1,t-1,g) - \text{outflow}(a,t,g) + \text{inflow}(a,t,g),
\]

Where \(a = \text{age}, t = \text{year}, g = \text{gender} \).

**General Calculation Scheme**

![Diagram](image)

12. As PROST keeps track of contribution years of service accrued by each cohort, the calculated number of new retirees – whatever method is used – is then adjusted so that the total length of service accrued by the cohort is equal to the total length of service claimed by the cohort at the time of retirement. After the number of new retirees is adjusted, the stock is recalculated using the “Flow” method.
13. The user can also choose how the benefit of new beneficiaries is specified – via benefit formula or via age and gender specific replacement rates.

14. As mentioned above, output produced by PROST is organized in five output modules. Each of the modules contains a number of Excel worksheets and a graphical summary on key output indicators:

- **Population Projection**: Population projections and pyramids, life tables, life expectancy changes, population dependency rates, etc.

- **Demographic Structure**: Labor force and employment projections, projections of contributors and beneficiaries, demographic structure of the pension system, and system dependency rates.

- **Finances of Single pillar PAYG**: Macroeconomic trends, wage projections, pension benefit projections for the existing and new pensioners, revenue and expenditure of the pension system, required adjustments to contribution rates and replacement rates for zero current balance, and the implicit pension debt.

- **Finances of Multi-pillar System**: Pension benefit projections for new and existing pensioners under each of the three pillars (conventional PAYG, notional PAYG, and funded DC), revenues and expenditure of both PAYG and funded pillars, implicit pension debt of the PAYG system after the reform, and results of the reform (compares benefit projections and financial standing under the single pillar PAYG and multi-pillar scenarios).

- **Individual accounts**: Lifetime contributions and benefits and individual related summary statistics for up to six different individuals specified in the “Profiles” input sheet under PAYG system (statutory, with adjusted contribution rates and with adjusted benefits) and multi-pillar system (for those who switched to the multi-pillar system and those who remained in the PAYG system).

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Annex 1: Data required for PROST from each pension fund

Being a cohort-based model, PROST is very data-intensive. Many input variables are required to be segregated by single year age and gender groups which can be derived only from pension funds administrative databases. Quality of data is crucial for quality of projection results, so data analysis will be done with respect to data gaps and overall quality of most important data entries to ensure that the data is good enough for producing good quality results.

1. Annual reports for the last 5-10 years (specifically information on the total number of contributors and beneficiaries in each beneficiary category, detailed statement of account).

2. The following information in the existing databases for contributors:
   - ID number;
   - Data of birth;
   - Gender;
   - Date of joining the system;
   - Current status (is the person currently contributing or stopped contributing);
   - Date of last contribution;
   - Accrued years/months of contributions;
   - Current pensionable wage;
   - Current full wage (if different from pensionable wage)
   - Current individual account balance (if applicable);
   - Contribution withdrawals (if applicable), amounts and dates.

3. The following information in the existing databases for pensioners:
   - ID number;
   - Data of birth;
   - Date of death;
   - Gender;
   - Date of joining the system;
   - Beneficiary category (e.g. old age, invalidity, survivorship, other);
   - Benefit payout form and amounts (e.g. current regular pension, commuted pension, grant benefit, contribution withdrawal if applicable, special lumpsum benefit to non-qualified retirees);
   - Date of retirement;
   - Accrued years of contributions.