

Pension Reform Options Simulation Toolkit



February 26, 2003
Johannesburg, South Africa



Outline

- Why model a pension system?
- Brief introduction to PROST
- Discussion on data requirements and potential data problems
- Discussions on reform options and methodology for projections

Why model a pension system?

- To serve as a diagnostic tool to assess the fiscal sustainability of the current system
- To provide information on current and future costs for policy decisions and planning purposes
- To analyze how much each generation would benefit from the system

Benchmark for sustainability

- How long can the system continue on a PAYG basis?
- If not, how high would the contribution rate have to be to maintain fiscal balance?
- Or, how low would benefits have to be to maintain fiscal balance?
- What are the government's liabilities now and over time?
- What is the individual's return on money paid into the system?

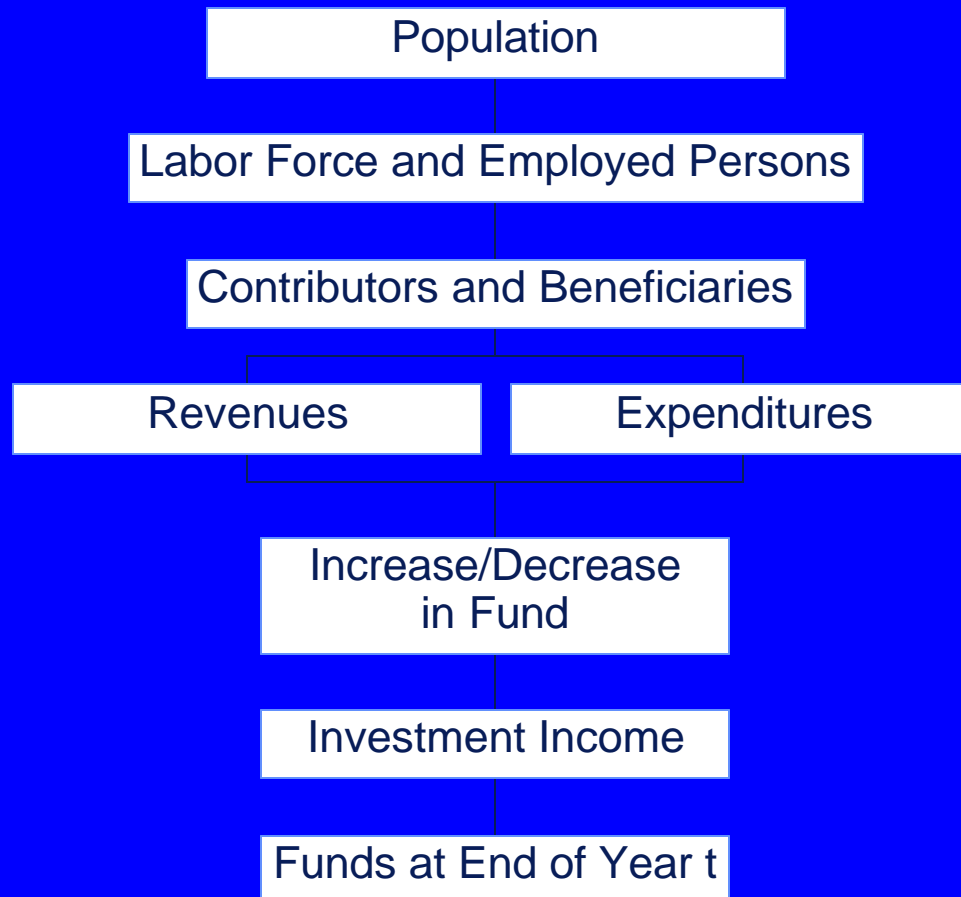
Assumptions and Limitations

- Results only as good as assumptions
- Risk of oversimplification
- May not be valid in the short or medium term
- Need for more in-depth sensitivity analysis

Basic Features

- Programmed in VBA with GUI
- Input and output via Excel
- Data Input -- six worksheets
- Data Output -- five modules
- Applicable to national pension schemes and State/Closed systems

Projection Methodology



Steps in Making a Pension Projection

- Calculate the population in each age and gender group
- Calculate the numbers of contributors and beneficiaries in each cohort
- Calculate the revenue figures using the total number of contributors in each cohort, the average wage of that cohort, the contribution rate and other revenue sources
- Calculate the expenditure figures, i.e., benefits to new retirees, indexation of benefits to stock of retirees, benefits to widows and orphans and other expenditures
- Calculate the current balance: revenue minus expenditures (with potential fund accumulation)

Input Module

General

Macro data
Pension parameters

Population

Age structure
Fertility
Mortality
Migration

Labor

Labor force participation
Unemployment
Age-earnings
Age-benefits

Pension

of contributors
of beneficiaries
Coverage
Length of service
Replacement rate

Reform

Parameters of reformed system

Individual Profiles

Gender
Entry age
Retirement age
Earnings profile
Mortality profile

Output Modules

Population

Population Pyramid
Life table
Life expectancy changes
Graphs & summary

Demographics

Contributors &
Beneficiaries
Length of service
Demographic Structure
System Dependency
Graphs & Summary

PAYG Financials

Macro trends
Wage info
Pension benefits
Financial Flows
IPD
Graphs & Summary

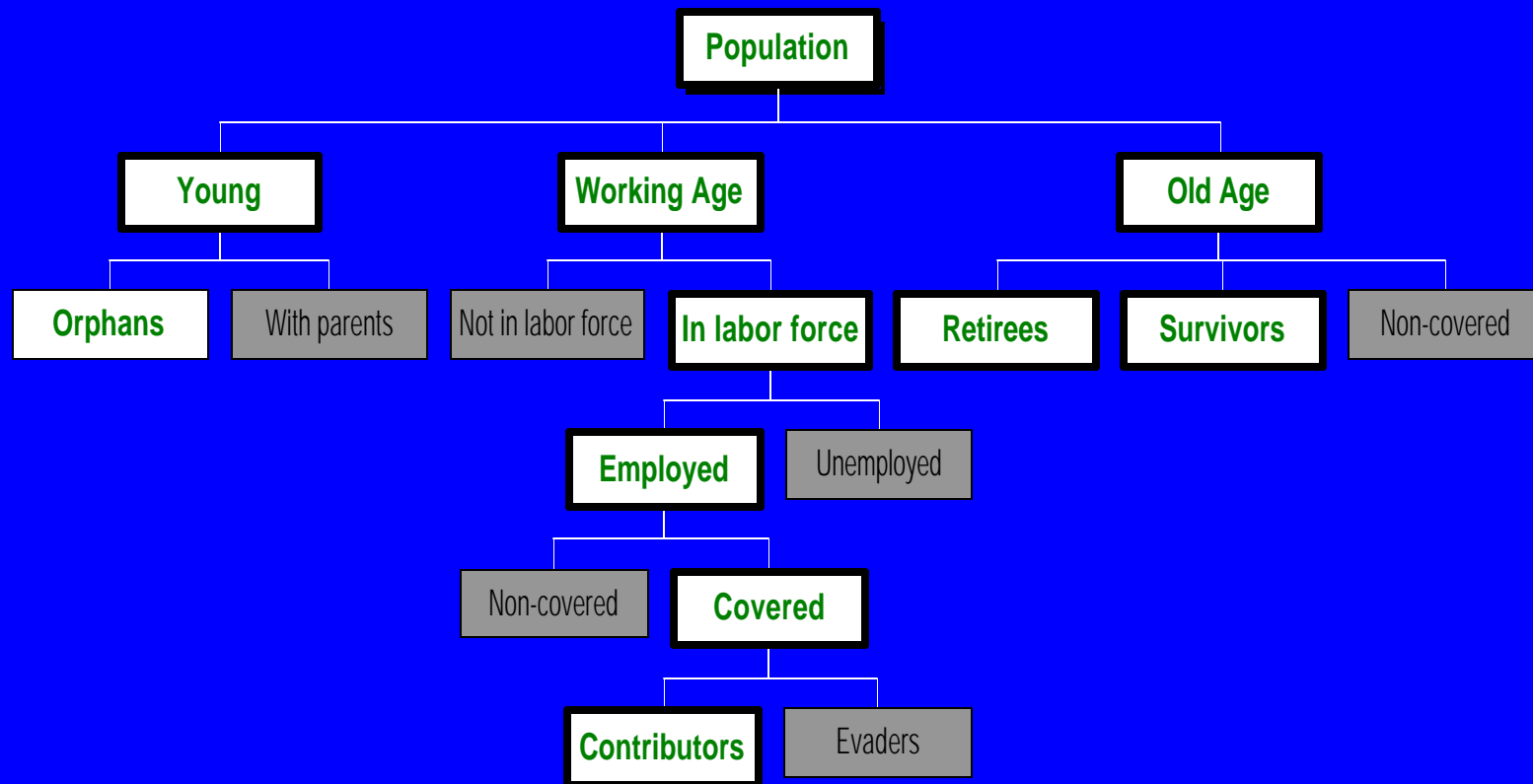
Finances of Multipillar

Financial flows:
Reformed PAYG
IPD
Notional PAYG
Funded Pillar
All pillars

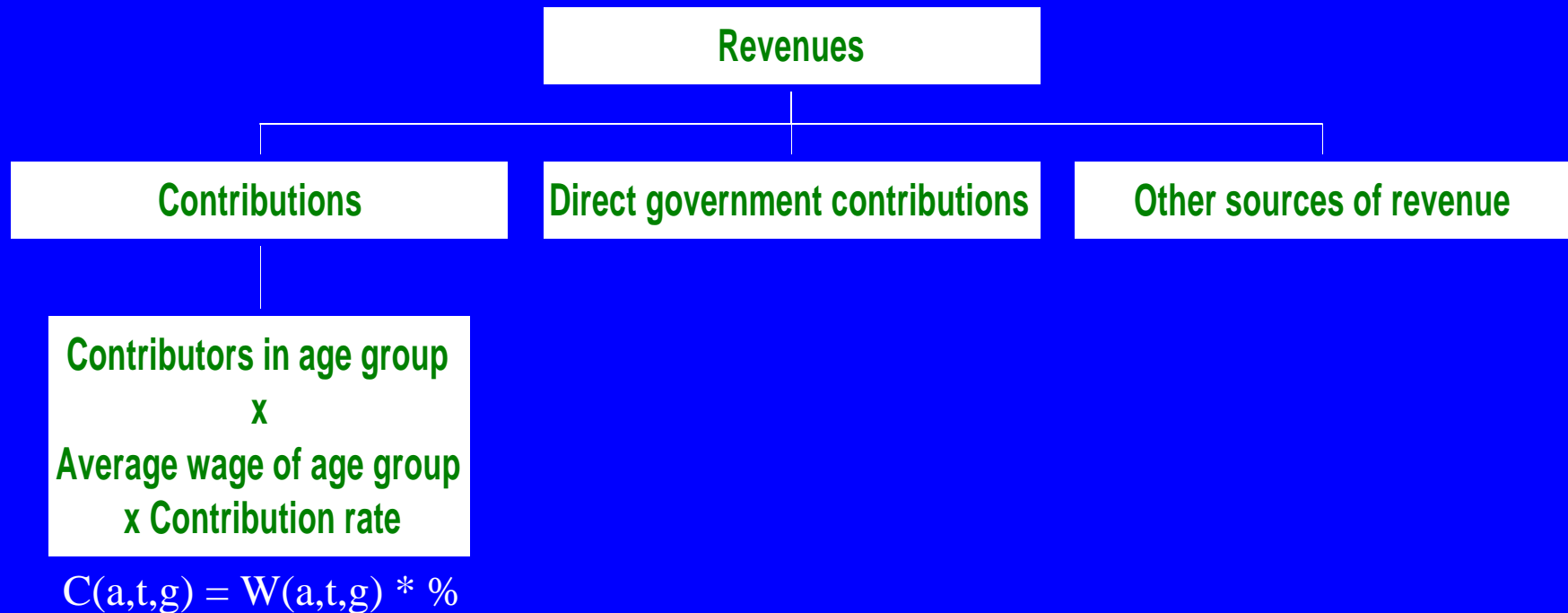
IRA

PAYG benefits with
-- Statutory CR
-- Required CR
Affordable benefits
DC
Mutlipillar scheme

Population/Pension Demographics

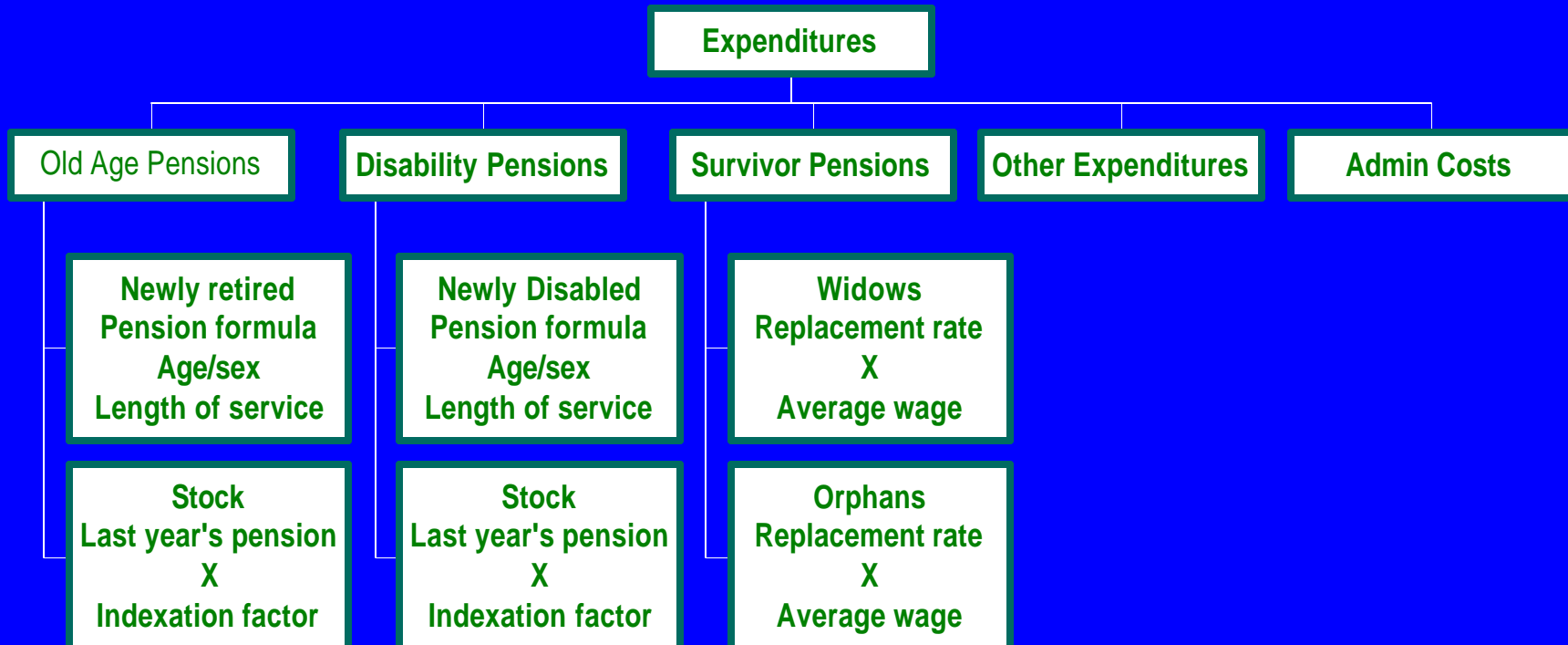


Revenues



Less: evasion and collection efficiency

Expenditures



Assets

- Revenues - Expenditures = Current Balance
- Fund Reserve = Last year's fund reserve
 - + Current Balance
 - + Investment Income

PAYG Reform Options

- Change contribution rates
- Change eligibility conditions
 - Retirement age
 - Years of service required
- Change benefits provided
 - Replacement rates
 - Salary base on which pensions are calculated
 - Indexation of benefits

How to model PAYG reforms?

- Full range of PAYG reforms
- Make changes to the input file
- Consider behavioral impact
- Compare cases

A Multipillar System

Possible combinations with:

- Conventional PAYG
- Notional accounts
- Defined contribution

Notional Accounts

- Account balances accumulated on individual basis
- Notional interest - based on wage bill, real wage, nominal wage, GDP growth, etc.
- Benefits based on account balances
- But financed on PAYG basis

Systemic Reform Options

- Any combination of the following:
 - Reformed (or unreformed) PAYG pillar
 - Notional PAYG pillar
 - Funded defined contribution pillar
- Who can switch? Who will switch?
- How will acquired rights be dealt with?
 - Proportional pensions
 - Recognition bonds

Individual Impact

Analysis on how individuals (with different years of service, income levels or from different generations) fare under different arrangements?

- Under statutory contribution/benefit rates
- If contribution rates changed to maintain PAYG balance
- If replacement rates changed to maintain PAYG balance
- Under pure funded defined contribution system
- Under multi-pillar

Civil Service/Closed Schemes

ENTRANTS

Positions available
Human resource policy

Current Civil
Servants

EXIT

Leave, disabled
die, retire

Next year's
stock of Civil
Servants

Other Uses for PROST

- Analysis of other types of benefits:
 - Social assistance
 - Family allowance
 - Unemployment benefits
 - Health expenditures
- Can be used for the analysis of provident funds

Countries Where PROST Has Been Used

