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Implementing an Indonesian National Social Security System

Modelling System Costs

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Jean-Noël Martineau
Plan of Presentation

I. Pension Modelling
II. The Basic Paygo Model
III. The Demographics of Indonesia
IV. Illustrative Cost Estimates - Alternative Financing Paths
I. Pension Modelling

- We focus here on pension modelling
- But the content of the presentation substantially apply to other social security programs as well
- Indeed most pension models may be easily adapted to generate costs for other types of programs because they require the same basic projections tools.
Estimating Pension System Costs

- This is a complicated task:
  - Many factors: demographics, economics, management performance
  - Factors interact with one another
  - Many different pension parameters
  - Parameters may change over time
  - Factors/parameters vary i.e. by age, gender, income level
  - Must project over very long periods

- A model recognized how each of these factors compound together to affect the fiscal position of a pension scheme and its main indicators

- A model increases rigor and discipline and assures consistency
The Need for Modelling does not Stop after Implementation

- Models are also needed to:
  - Monitor cost trends
  - Test resilience of system
  - Cost potential amendments
  - Perform statutory reviews
  - Measure implicit pension debt
  - Perform special studies

- Model needs are *PERMANENT*
Models Are Dynamic

- No model is ever finished
- A model is continually subject to changes
  - To test ideas for modifying the system
  - To reflect newly adopted amendments
  - To reflect new administrative practices and control
  - To deal with newly or no longer available data
  - To add or modify outputs
- Therefore models must be **FLEXIBLE**
Effective Technical Assistance

- Not sufficient to deliver a foreign-made model and show how to operate it
- Should aim for developing genuine, autonomous and permanent modelling skills
- The ideal approach would be to help Indonesia develop its own model
  - But no time for that now
  - A compromise approach is to bring in an existing model and adapt it to Indonesia’s particular circumstances
  - Develop local modelling capacity that allows Indonesia to keep the model in line with its needs
Existing Pension Models

- Several credible and sound software-based pension models exist:
  - WB’s PROST
  - ILO’s
  - Wiese’s PRISM
  - Wilkin’s
  - Ernst & Young’s DemPen
- Effective customization requires access to programming codes
II. The Basic Paygo Model
Definitions

- The *Old Age Dependency Ratio* (DR) refers to the general population

\[
DR = \frac{P_{65+}}{P_{15-64}}
\]

- The so-called *System Dependency Ratio* (SDR) refers to a pension system

\[
SDR = \frac{\#\text{Beneficiaries}}{\#\text{Contributors}}
\]
The Basic Paygo Model (1)

- Under a pure PAYGO scheme
  - Contributions = Benefit Payments by definition
  - Ignoring lump sums and expenses
    - \([\text{Cont. Rate} \times \text{Number of Contributors} \times \text{Avg. Wages}] = [\text{Avg. Pension} \times \text{Number of Beneficiaries}]\)
  - Rearranged: \(\text{CR} = \text{RR} \times \text{SDR}\)
    - \(\text{CR} = \text{Required Contribution rate}\)
    - \(\text{RR} = \text{Average pension level relative to average wages}\)
    - \(\text{SDR} = \text{Number of beneficiaries per contributor i.e. the so-called System Dependency Ratio}\)
What does the Basic Paygo Model tell us?

- For a given pension level (RR), paygo cost trends depend directly upon SDRs
- For a given set of pension eligibility rules, SDR trends depend almost directly upon DRs
- Then for a given pension level paygo cost trends depend almost directly upon general population trends i.e. DRs
Conclusion: Demographics Drives Paygo Costs

- Decreases in *fertility* reduce the weight of young individuals relative to the older people and increase DRs and hence SDRs.
- Improvements in *mortality* at old age also increase DRs and hence SDRs.
- *Migration* also has effects similar to fertility.
- The effects of demographic changes are slow to emerge but they last for very long periods.
- This is why demographic effects can and must be anticipated long in advance.
- Demographic changes cannot be altered; they can only be anticipated and managed.
III. The Demographics of Indonesia
Urbanization Rates
Indonesia vs Rest of the World
1950 - 2030
Mortality

- Life expectancy (LE) captures mortality improvements
- Pension costs are almost only sensitive to post-retirement mortality
- Then it is LE at retirement age that matters
- Here we use LEs at birth for this analysis because LEs at retirement are not available
- Also in the future most gains in LE will come from reduction in old age mortality
  - Most infant mortality improvements already done
  - Children and adult mortality rates are already low
Life Expectancy @ Birth
Indonesia
UN Projections 2000 - 2050

Male Female
<table>
<thead>
<tr>
<th>Country</th>
<th>Male 1950</th>
<th>Female 1950</th>
<th>Male 1998</th>
<th>Female 1998</th>
<th>Male Gain</th>
<th>Female Gain</th>
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<td>67.0</td>
<td>74.1</td>
<td>80.7</td>
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<td>70.8</td>
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<td>69.4</td>
<td>74.6</td>
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<td>83.3</td>
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<td>11.6</td>
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<tr>
<td><strong>Average</strong></td>
<td><strong>63.9</strong></td>
<td><strong>68.6</strong></td>
<td><strong>74.3</strong></td>
<td><strong>81.1</strong></td>
<td><strong>10.4</strong></td>
<td><strong>12.5</strong></td>
</tr>
</tbody>
</table>

**LE Gain per Year**
- Male: 2.6 months
- Female: 3.1 months
Indonesia Population
Age Pyramid
UN Projections - 2050

Male  Female
Indonesia Old Age Dependency Ratio @ 65
Observed & Projected
1950 - 2050

- Observed
- UN Projections - Medium Variant
System Dependency Ratio
According to Various Retirement Ages

RA = 55
RA = 60
RA = 65
Why SDRs > DRs?

- Although DR and SDR trends are similar, SDRs are generally substantially higher than DRs
  - Most participants start at age > 15
  - Most participants retire at age < 65
  - Disabled, survivor and children pensions
  - Inactive and unemployed who have accrued pensions – not recognized in our projections
  - Covered population is often significantly older than non-covered population - not recognized in our projections
IV. Illustrative Cost Estimates
Starting Parameters

- Contributions start in 2005
- Benefits start in 2006
- Projections to 2100
- Basic flat old age benefit
  - Initial level = 300,000 Rp of 2003 per month
  - About 72% of Minimum Monthly Wages
- Eligibility subject to minimum number years of service
- First cohorts are grandfathered in
Main Pension Provisions

- Retirement age: 55, 60 and 60 adjusted
- Indexation of old age benefit payable at retirement: 100% and 50% of real wages
- Indexation of pensions in payment: 100% of prices
- Disability pension = 80% of old age benefit
- Spousal Pension = 2/3 of old age pension
  - Payable to those within 15 years of retirement age
  - Otherwise a lump sum = 10 millions Rp of 2003
    - Or about 24 x monthly min. wages
- Children pension => 20% of old age benefit
Demographic Assumptions

- Total Fertility Rate
  - 2.4 in 2002 => 1.95 over 20 years
- Mortality Improvement
  - 1% for all ages and all years
  - LE @ Birth increases from 66 in 2003 to 78 in 2100
- Net migration => Nil
- By no means the worst case scenario
  - UN projections
    - LE @ Birth = 77 in 2050
    - TFR medium variant = 1.85 and low variant = 1.35 by 2025
    - Migration => negative but very small
Economic Assumptions

- Real wage / productivity growth – 3% decreasing to 2% over 40 years
- Real GDP growth – linked to productivity and employment
- Real interest rate – 5% decreasing to 3.5% over 30 years
- Inflation – implicit (All values in constant Rp)
Work Force & Coverage Assumptions

- Labour participation rates
  - Constant over time
- Unemployment rates
  - Constant over time
- Effective coverage rate
  - Constant over time
Management Performance Assumptions

- Collection rate
  - 90% => 97% over 20 years

- Administrative expenses as % of benefits paid
  - 30% => 8% over 20 years

- Real rate of return as % of benchmark
  - 75% => 95% over 15 years

- Asset management expenses
  - 0.4% => 0.2% over 20 years
Scenario #1

- Retirement age (RA) is set and kept unchanged at 55
- Benefit level is indexed to full wage growth
Paygo Cost as % of Payroll
RA = 55 and Full Wage Indexation
Scenario #1

0% 5% 10% 15% 20% 25% 30%
2003 2011 2019 2027 2035 2043 2051 2059 2067 2075 2083 2091 2099
Alternatives to Paygo

- Funding reduce future costs by returns on large accumulated assets
- Under full funding assets measure in multiples of GDP – this raises concerns
  - Problem of concentration
  - Investment opportunities are limited
  - Large asset accumulation makes cost very sensitive to asset management performance
- Hence asset accumulation need to be modest
- Cost stability is also a chief objective
- Between paygo and full funding there exists a host of other funding approaches
The Level Cost Method (LCM)

- Contribution rate is set as a level % of wages
- PV future contributions = PV future expenditures + PV desired asset reserve at the end of the projection period
  - Applied to a very long projection period
  - Recalculate every 3-5 years for a projection period of same length and adjust rate if necessary
  - Adjustments are small since deviations in experience and changes in assumptions are amortized over a very long period
- Advantages: simplicity, cost stability and modest asset accumulation
Cost Saving Measures

- Scenario #2 - Increase retirement age to 60
- Scenario #3 – Adjust RA gradually from 60 to offset the effects of aging and stabilize costs over time
  - 1/5 per year for the first 20 years
  - 1/8 per year thereafter
  - RA reaches 65 in 2034 and 70 in 2074
- Scenario #4 - Index the old age benefit payable at retirement to 50% of real wages
Paygo Cost as % of Payroll
All Scenarios

Paygo & RA = 55 + 100% Wages Index
Paygo & RA = 60 + 100% Wages Index
Paygo & RA = 60 Adjusted + 100% Wages Index
Paygo & RA = 60 Adjusted +50% Wages Index
Cost as % of Payroll
Scenario #4

Paygo & RA = 60 Adjusted + 50% Wages Index
Level & RA = 60 Adjusted + 50% Wage Index
Full Funding Asset Reserves
Rule of Thumb Estimates
% of GDP
All Scenarios
Old Age Benefit
As % of Average Wages
New Retirees Only

- 100% Wage Indexation
- 50% Wage Indexation
## Summary - Level Cost Estimates

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Management Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Improved</td>
</tr>
<tr>
<td>Retirement age = 55 &amp; indexation = 100% wages</td>
<td>18.0%</td>
</tr>
<tr>
<td>Retirement age = 60 &amp; indexation = 100% wages</td>
<td>12.8%</td>
</tr>
<tr>
<td>Retirement age = 60 adjusted &amp; indexation = 100% wages</td>
<td>7.2%</td>
</tr>
<tr>
<td>Retirement age = 60 adjusted &amp; indexation = 50% wages</td>
<td>4.6%</td>
</tr>
</tbody>
</table>
## Summary of Impact of Cost Saving Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase retirement age from 55 to 60</td>
<td>-29%</td>
</tr>
<tr>
<td>Increase retirement age gradually from 60</td>
<td>-44%</td>
</tr>
<tr>
<td>Reduce indexation from 100% to 50% of wages</td>
<td>-36%</td>
</tr>
<tr>
<td>Other - Improvement in management performance</td>
<td>-24%</td>
</tr>
</tbody>
</table>
Conclusions

- To be affordable the system must be modest at the start
- Important not to create unrealistic expectations - for example as to the indexation and retirement age
- Because demographic pressures will most likely force reduction of benefits
- Thus necessary to complement the pension scheme with other sources of retirement income
The End

Thank you for your attention!