Literature review

- Reform = introduce some notion of funding into the system
Literature review

- Reform = introduce some notion of funding into the system
- Political economy of pension systems: will the reform be implemented
  - Extant literature on whether or not privatization is in fact welfare enhancing: Conesa and Kruger (1999), Nishiyama and Smetters (2007), Fehr (2009)
Motivation

![Graph showing motivation over time]

- **Motivation Model Results**

- **Motivation**
Despite general welfare gains...

... most of these reforms got reversed: Jarrett (2011); Schwarz et al. (2014)

Goals and expectations

Goal
Suppose there already is a reform, with stable gains in the long-run: does it eventually become politically stable?

Expectations
- With passing of the initially old cohorts, welfare gains become majoritarian
- Intend to understand/explain the reversing of reforms
Outline

1 Motivation

2 Model

3 Results
Agents

- "born" at age 20 \((j = 1)\) and live up to 100 years \((J = 80)\)
- subject to time and cohort dependent survival probability \(\pi\)
- choose labor supply \(l\) endogenously until exogenous retirement age \(\bar{J}\) (forced to retire)
Agents

- "born" at age 20 ($j = 1$) and live up to 100 years ($J = 80$)
- subject to time and cohort dependent survival probability $\pi$
- choose labor supply $l$ endogenously until exogenous retirement age $\bar{J}$ (forced to retire)

- optimize remaining lifetime utility derived from leisure $1 - l$ and consumption $c$

$$U_{j,t} = \sum_{s=0}^{J-j} \left[ \delta^s \frac{\pi_{j+s,t+s}}{\pi_{j,t}} u(c_{j+s,t+s}, l_{j+s,t+s}) \right]$$

with

$$u(c, l) = \log(c^\phi (1 - l)^{1-\phi})$$
Agents

- receive market clearing wage for labor
- receive market clearing interest rate on private savings
- receive pension income + unintentional bequests
- pay taxes
Agents

- receive market clearing wage for labor
- receive market clearing interest rate on private savings
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- pay taxes

Subject to the budget constraint

\[
(1 + \tau^c_t)c_{j,t} + s_{j,t} = (1 - \tau^l_t)(1 - \tau^l)w_{j,t}l_{j,t} \\
+ (1 + (1 - \tau^l_t)r_{j,t})s_{j-1,t-1} \\
+ (1 - \tau^l_t)p_{j,t} \\
+ b_{j,t} \\
- \Upsilon_t
\]

← labor income
← capital income
← pension income
← bequests
← lump-sum tax
Firms

- Perfectly competitive representative firm
- Standard Cobb-Douglas production function

\[ Y_t = K_t^\alpha (z_t L_t)^{1-\alpha} \]

- Profit maximization implies

\[ w_t = z_t (1 - \alpha) k_t^\alpha \]
\[ r_t = \alpha k_t^{\alpha - 1} - d \]
Government

- collects taxes on earnings, interest and consumption (sum up to $T$)
- spends GDP fixed share of GDP on government consumption $G$
- collects social security contributions and pays out pensions of DB and NDC system

\[
subsidy_t = \tau^l \sum_{j=1}^{\tilde{J}-1} w_{j,t} l_{j,t} - \sum_{j=\tilde{J}}^{J} p_{j,t} N_{j,t}
\]

- services debt $D$ and maintains debt/GDP ratio fixed
- lump-sum taxes $\Upsilon$ adjust to satisfy the govt budget constraint

\[
G_t + subsidy_t + (1 + r_t) D_{t-1} = T_t + D_t + \Upsilon_t \sum_{j=1}^{J} N_{j,t}
\]
Pension system

Initial steady state: defined benefit

- Exogenous contribution rate $\tau$ and an exogenous replacement rate $\rho$

\[ p_{\bar{J},t}^{DB} = \rho w_{\bar{J}-1,t-1} l_{\bar{J}-1,t-1} \]

indexed by 25% of total payroll growth
Pension system

Initial steady state: defined benefit

- Exogenous contribution rate $\tau$ and an exogenous replacement rate $\rho$
  \[
  p_{J,t}^{DB} = \rho w_{J-1,t-1} l_{J-1,t-1}
  \]
  indexed by 25% of total payroll growth

Reform: partially funded defined contribution

- Exogenous contribution rate $\tau$ and actuarially fair individual accounts
  \[
  p_{J,t}^{DC} = \frac{\text{accumulated sum of contributions}_{J,t}}{\text{expected remaining lifetime}_{J,t}}
  \]
- In PAYG: Contributions and pensions are indexed by 25% of total payroll growth
- In funded part: return on capital, tax free
Political economy

What happens within each vote?

- Policy 1 - shift of contributions: funded \(\Rightarrow\) PAYG
- Policy 2 - shift of pensions: annuity \(\Rightarrow\) benefit
- Policy 3 - a combination of the two
Political economy

What happens within each vote?

- Policy 1 - shift of contributions: funded ⇒ PAYG
- Policy 2 - shift of pensions: annuity ⇒ benefit
- Policy 3 - a combination of the two

- We run these votes in subsequent years
- If consumption equivalent positive, a cohort is in favor
- If a policy gains majority, it is put in place
- Order of voting irrelevant (Dhami and al Nowaihi, 2010)
Voting results: reforms are never stable
Why are reforms never stable?

![Graph showing Payroll growth rate and Interest rate over time](image_url)
Pension benefits (year 14 and year 44)
Debt share (year 14 and year 44)
Taxes (year 14 and year 44)
Shift of pensions becomes unviable quite fast

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<tr>
<th>Voting year</th>
<th>Winning policy</th>
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<tr>
<td>2014</td>
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<td>2054</td>
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<td>2084</td>
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<td>2154</td>
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Super-responsible debt-reducing

We try one more scenario: compare “responsible” (fiscally) to “responsible” (pension-wise)

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<tr>
<th></th>
<th>2012</th>
<th>2022</th>
<th>2032</th>
<th>2042</th>
<th>2052</th>
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<td>for Policy 1 in %</td>
<td>25</td>
<td>48</td>
<td>80</td>
<td>90</td>
<td>95</td>
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<td>for Policy 2 in %</td>
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<td>48</td>
<td>43</td>
<td>7</td>
<td>21</td>
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<tr>
<td>for Policy 3 in %</td>
<td>30</td>
<td>57</td>
<td>64</td>
<td>53</td>
<td>40</td>
</tr>
</tbody>
</table>

- Support for Scenario 1 as of 2032 continues
- Support for Scenario 3 decreases after 2042
Conclusions

- We allow subsequent votes of pension system reform reversion to seek when do they become politically stable.
- The votes concern scenarios with long-run welfare deteriorating policies.
- We find that:
  - funded is never preferred to PAYG.
  - annuity becomes preferred to benefit.
- Our model has no political risk, business cycle, etc.
- Pension reform reversion is preferred always if it reduces taxes for the living cohorts.
Questions or suggestions?
Thank you!

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