Index linked bonds, pensions, and government debt management

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Outline

- **General framework**
  - optimal distribution of risks: who should bear the risk?
  - role of pension funds, government and other institutions

- **Demand side**
  - need for index linked bonds
    - missing markets for price, longevity, wage indexed bonds
  - and more specific for Dutch pension funds
    - increasing costs of mismatch risks
    - costs of nominal regulatory framework

- **Supply side**
  - can the government bear additional longevity, price and wage risk?
  - implications for debt management and stability of public finances

- **Towards a new and real regulatory framework**
  - for pension funds
  - as well as government finance
General framework: scope for risk sharing

Scope for risk intergenerational sharing:
- pensioners tend to bear too much (financial) valuation risk ($r$)
- and workers too much productivity risk ($w$)
- all bear longevity risk ($n$), but in uneven manner
- (also other risks: climate, health care costs, diseases,..)

And these risks are big over a long term horizon!

- **economic growth**: plus or minus 1% growth per year = 35% higher or lower income for next generation
- **longevity**: 3,4 years longer life expectancy increase raises ageing burden by 2,5% on a yearly basis
- **financial risks**: no comment needed
- **inflation risk**: why do we allow this at all? (“institutional failure ”?)
Risk sharing mechanisms

- "DB" pension system
  - wage linked pension (1st and 2nd pillar)
    - transfers \{r, n\} risks from old to young
      - large welfare gains (5% -20%) for \{r\} risks only
    - transfers \{w\} risks from young to old
      - welfare gains (size ?)

- government budget / debt policy
  - risk sharing between current generations, for each type of shocks \{w,r,n\}
  - and with future generations as well
    - through falling/growing public debt
    - "tax smoothing"

*Note that government is better equipped for intergenerational risk sharing: power of taxation = power to commit future generations (Henning Bohn)*

- other institutions: family (bequests), health care system, ...
General:

Large increase in risk exposure of Dutch households and pension funds requires change in risk sharing institutions, including pension funds.
Increasing risk exposure Dutch households
Increasing risk exposure Dutch households
Caused by change in pension fund portfolios and increasing (debt financed) housing wealth

- Increasing risk exposure of Dutch households and pension funds
  - increasing share of risky assets (housing + stock) 1980-2007
    - from 50% to 85% of total financial wealth
      - of which 4% to 24% due to portfolio shift of pension funds
    - from 200% to 700% of disposable income
      - of which 15% to 194% due to portfolio shift of pension funds

- At the same time: decreasing risk capacity of pension funds
  - maturing of funds
  - ageing
    - pension burden relative to wages to be expected
    - up from 200% in 1990 to 400% in 2040
Limits to risk sharing for pension funds

Pension burden

Wage sum
Caused by change in pension fund portfolios and increasing (debt financed) housing wealth

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- Growing costs of mismatch risk in pension funds
  - “pension recession” due to contribution rate increase 5% in 2002
Pension recession 2002

![Graph showing pension contributions and GDP from 1995 to 2005. The graph illustrates the pension contribution rate and GDP over the years, with a clear decline in pension contributions during the recession in 2002.]
Caused by change in pension fund portfolios and increasing (debt financed) housing wealth

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  - “pension recession 2002”

- Longevity risk

=> rethink risk sharing institutions !!
Rethink pension institutions

- Less scope for mismatch risk in pension funds
  - company pension funds:
    - shareholders less willing to take residual risks
    - not only because of IFRS...
  - sectoral pension funds:
    - shifting risks to future generations becomes increasingly difficult

- The government is better equipped for intergenerational risk sharing than pension funds are.
  - power of taxation = power to commit future generations

- How to reduce mismatch risk in second pillar pensions?
  - more risk in pensions: elderly must share in total \( \{w, r, n\} \) risks
  - and if you want to keep wage linked (“DB”) pensions in 2nd pillar the government should take over the risk by issuing new instruments:
    - longevity linked bonds
    - wage linked bonds
    - inflation linked bonds
Long term perspective

- Government can enhance welfare by
  - completing markets
  - taking care of intergenerational risk sharing

- But not at any cost
  - transaction costs of completing markets must be compensated by welfare gain
  - new risks should not disrupt government finance

"Is the government able to bear all longevity risk?" (OECD, 2007)

- Proper perspective is welfare
  - optimal intergenerational risk sharing
  - no excuse to shift all risks to future
  - only a fair share of risk not all risks should be shifted to future generations
Note: the short run perspective matters as well!

- More pragmatic
- Is the government really able to cope with risks?
- And how do (additional) risks affect the stability / predictability of the budgetary process and the government balance?

Illustration: inflation indexed bonds in the Netherlands
Case: Should the Dutch government issue inflation indexed bonds?

- Inflation indexed bonds may help pension funds to reduce risks of pension funds
  - if they want to reduce risks
    - involves costs
  - if they aim at “real” pensions or at least a “real” minimum pension

- Inflation indexed bonds will increase inflation exposure on public debt: what are the consequences?
  - how would this affect the stability or predictability of the government balances?
  - what is the price of inflation linked bonds (the liquidity premium is a social cost; the inflation risk premium not)
Debt management in the Netherlands

Nominal framework
- nominal EMU balance is still one of the key parameters of budgetary policy, despite alternative of long term sustainability
- EMU balance = primary balance - nominal interest payments
- EU: 3% maximum deficit rule Stability&Growth Pact

Debt management in the Netherlands
- minimise expected cash payments on public debt
- given some maximum of risk exposure in nominal terms

(so not only nominal, but also very partial: it neglects the broader portfolio of the government)
Would inflation index bonds destabilise Dutch public finances,

or more specific, does it make the results on government finances less predictable

obviously this depends on the framework adopted

- in a nominal framework with the nominal EMU balance as key indicator it is obvious that inflation indexed bonds will make debt service less predictable
- in a real framework the reverse is true however: here inflation linked bonds make debt service more predictable
Also covariance matters...

- However, not only variance in debt service matters, but also the covariance between inflation and the government balances matters!
  - Could inflation linked bonds offer a hedge?

\[ \text{EMU balance} = \text{Primary balance} (p) + \text{Debt service} (p) \]

- Theory:
  - if demand shocks dominate:
    \[ \Rightarrow \text{covariance (inflation, GDP)} > 0 \]
    \[ \Rightarrow \text{covariance (inflation, gov. balance)} > 0 \]
    \[ \Rightarrow \text{inflation linked bonds are stabilizing: hedge} \]
  
  - if supply shocks (e.g. oil price) dominate,
    \[ \Rightarrow \text{covariance (inflation, GDP)} < 0 \]
    \[ \Rightarrow \text{covariance (inflation, gov. balance)} < 0 \]
    \[ \Rightarrow \text{inflation linked bonds are destabilizing} \]
Debt deflation and government balances, Netherlands 1970 - 2008
## Inflation and government balances, 1970-2003

<table>
<thead>
<tr>
<th></th>
<th>Constant term</th>
<th>Slope</th>
<th>$R^2$</th>
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<tbody>
<tr>
<td>Nominal EMU balance</td>
<td>-3.52 (0.61)</td>
<td>0.22 (0.13)</td>
<td>0.08</td>
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<td>Standard errors</td>
<td></td>
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<td>between brackets</td>
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1% higher inflation
  ► EMU balance + 0.22%

in case of 10% index linked bonds (50% debt /GDP ratio):
  ► EMU balance + 0.22% - 0.05% = 0.17%

=> Inflation linked bonds could provide a hedge, but small and uncertain

Note: Short debt could do the same - but less perfect - if interest and inflation are positively correlated in short term.

So are inflation linked bonds attractive to the government?

Hedge is not a major reason to issue inflation index bonds

Short term predictability is - in practice - more important, but whether inflation linked bonds are attractive or not depends fully on the choice between nominal and real definition of EMU balance.
Conclusions

- **Demand**
  - Pension funds may need index linked bonds iff
    - they accept matching strategies (because mismatch risk becomes too costly)
    - accept that (wage linked) DB pensions are expensive and require higher contribution rates
    - Current nominal regulatory framework replaced by a “real” framework

- **Supply**
  - Government may supply index linked bonds if
    - it adopts a long term welfare perspective
    - drop current narrow nominal framework for debt management and moves to a “real” framework encompassing the broad portfolio of the government (including future liabilities)
    - markets are sufficiently deep (European coordination) to reduce transaction costs and liquidity premium