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# **Index linked bonds, pensions, and government debt management**

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# Outline

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- 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

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- 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

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- “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, ...



## Demand side:

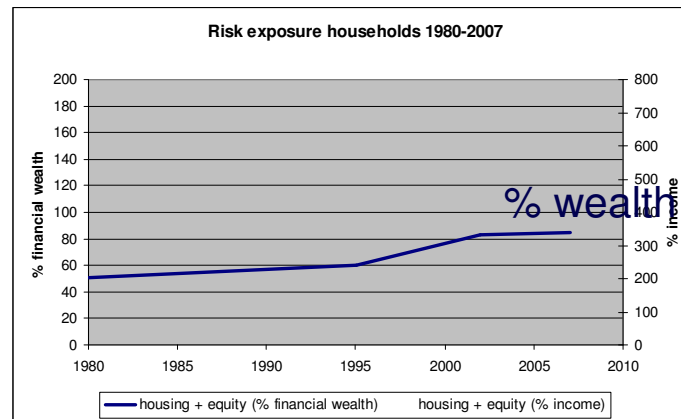
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- General:

Large increase in risk exposure of Dutch households and pension funds requires change in risk sharing institutions, including pension funds

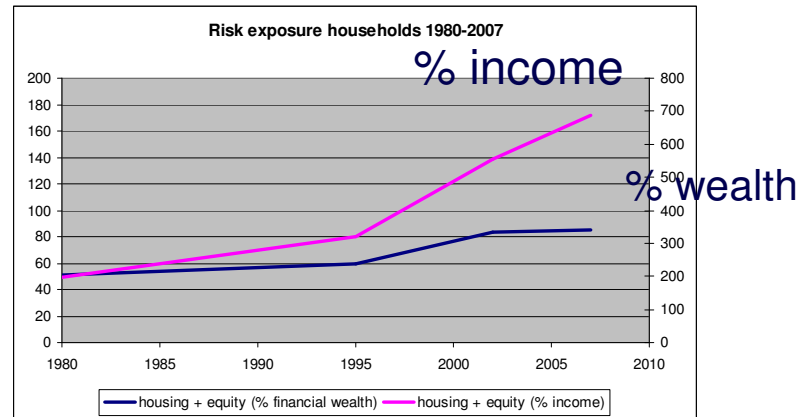


# Increasing risk exposure Dutch households





# Increasing risk exposure Dutch households





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

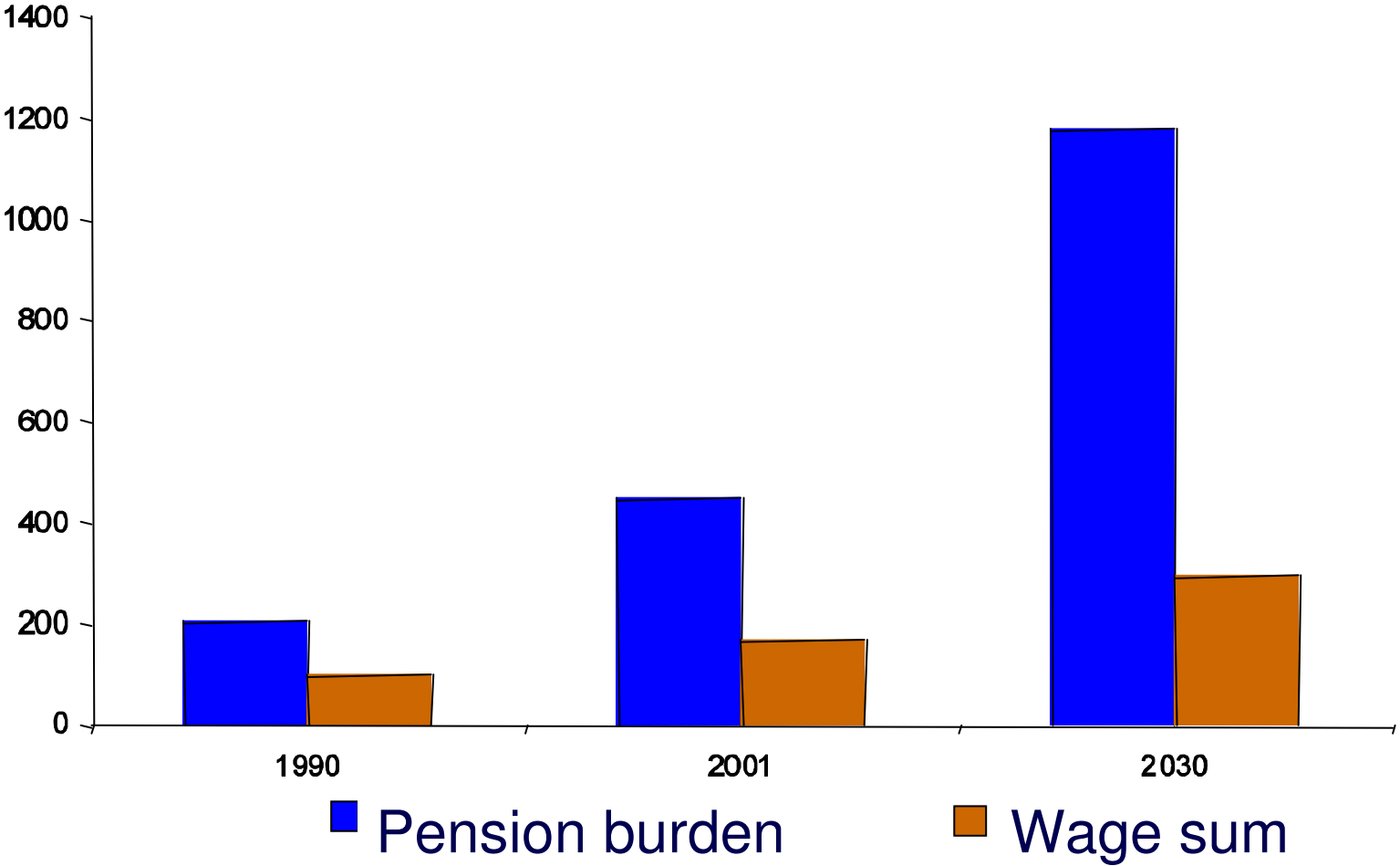
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- Increasing risk exposure of Dutch households and pension funds
  - ▶ increasing share of risky assets (housing + stock) 1980-2007
    - from 50% to 85% of total financial wealth
      - of which 4% to 24% due to portfolio shift of pension funds
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





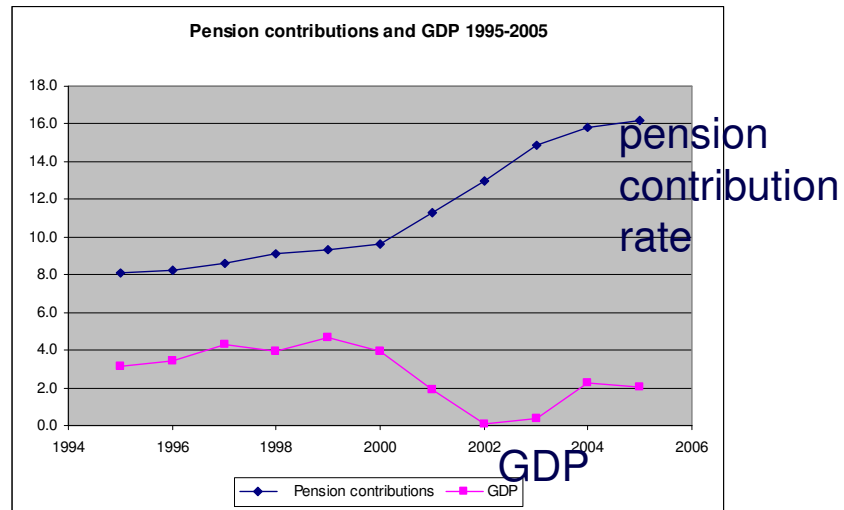
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- Growing costs of mismatch risk in pension funds
  - ▶ “pension recession” due to contribution rate increase 5% in 2002



# Pension recession 2002





## 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 2002”
  
- + Longevity risk
  - ▶ => *rethink risk sharing institutions !!*



# Rethink pension institutions

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- 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



# Supply side

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## ■ 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



## Supply side

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- 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?

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- 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

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## ■ 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)



# Issues

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- 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...

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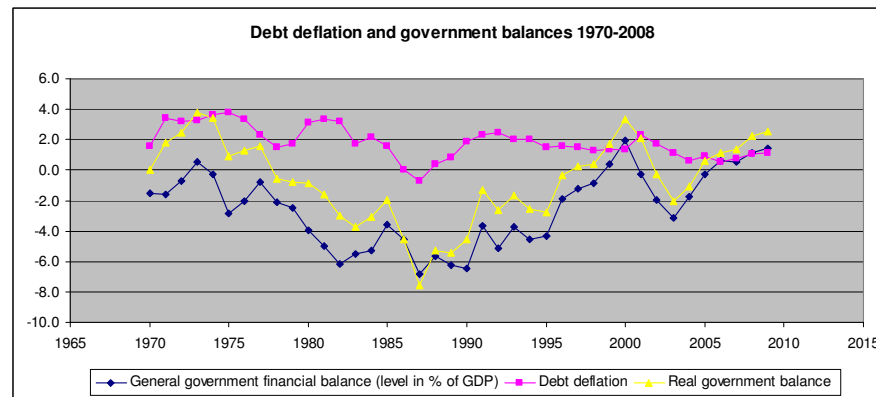
- However, not only variance in debt service matters, but also the covariance between inflation and the government balances matters!
  - ▶ Could inflation linked bonds offer a hedge?

$$EMU\ balance = Primary\ balance\ (p) + Debt\ service\ (p)$$

- Theory:
  - ▶ if demand shocks dominate:
    - ⇒ covariance (inflation, GDP) > 0
    - ⇒ covariance (inflation, gov. balance) > 0
    - ⇒ inflation linked bonds are stabilizing: hedge
  - ▶ if supply shocks (e.g. oil price) dominate,
    - ⇒ covariance (inflation, GDP) < 0
    - ⇒ covariance (inflation, gov. balance) < 0
    - ⇒ inflation linked bonds are **destabilizing**



# Debt deflation and government balances, Netherlands 1970 - 2008





## Inflation and government balances, 1970-2003

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	Constant term	Slope	R <sup>2</sup>
Nominal EMU balance	-3.52 (0.61)	0.22 (0.13)	0.08
Standard errors between brackets			

- 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

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## ■ 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