# *Pensions schemes by points versus NDC, a focus on French and German schemes*

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# *Very brief summary*

- Pure NDC - actuarially fair at level - are not ideal NDC;
- How far French and German point systems are they from the NCD?
- Some remarks about NDC, fairness, efficiency, automatic stabilizing.

# Organisation of the paper

- A quick description of French and German Pension Schemes;
- NDC and Actuarial Fairness: from Incentives to pure NDC
- NDC and Resistance to Various Shocks
- Conclusions: Nobody ’s perfect.

# France: Schemes and contributions in the main pension scheme

| ***Considered wage share:*** Population | ***TRA (0/SS ceiling)*** | ***TRB (up to 4XTRA)*** | ***TRC (up to 8 X TRA)*** |
|---|---|---|---|
| Non executives | CNAV<br>*Wage earners: 6.55*<br>*Firms: 8.2 %* | | |
| | + Firms: 1.6 of the total wage | | |
| | ARRCO<br>*Cont. Rate: 6%*<br>*Call rate: 125*<br>*(firm: 4.5/wage earner: 3)* | ARRCO<br>*Cont. Rate: 10%*<br>*Call rate: 125* | |
| Executives | CNAV<br>*Id upper*<br>ARRCO<br>*Cont. Rate:6*<br>*Call rate: 125* | AGIRC<br>*Cont. Rate:10*<br>*Call rate: 125* | AGIRC<br>*Cont. Rate:10*<br>*Call rate: 125* |

# France: a DC scheme by points

Individuals ' pension:

$$P_{C+A}^{i} = \sum_{t=t_0+1}^{A} \frac{\tau_{t-1} * w_{t-1}^{i}}{PP_{t-1}} * VP_{C+A}$$

Ressources of the scheme:

$$R_t = \sum_i \tau_t * w_t^i * coeff_t$$

# France: management of the schemes by points

- AGIRC and ARRCO are private associations;
- Boards - helped by experts - do forecasts and deduce the values of VP (value of points when people retire), PP (purchasing price of the points), coeff. (in order to increase ressources without increasing pensions).

# Germany: a DC scheme by points

Individuals ' pension:

$$P_{C+A}^{i} = \sum_{t=t_0}^{A} \frac{w_{t-1}^{i}}{\overline{w}_{t-1}} * \alpha^{i} * VP_{C+A}$$

$$\alpha = 1 - [0.003(780 - A(12)]$$

# Germany: forecasted decrement of the pensions

- A rather low contributory ceiling (1.8 times the average wage ; 8 times in France). Adjustments rely on the value of point VP.

$$VP_t = VP_{t-1} * \frac{\overline{w}_{t-1}}{\overline{w}_{t-2}} * \frac{x - \tau_{t-1} - \mu_{t-1}}{x - \tau_{t-2} - \mu_{t-2}} * SF_t$$

$$SF_t = \left( 1 - \frac{s_{t-2} * N_{t-3} / N_{t-2}}{s_{t-3} * N_{t-4} / N_{t-3}} \right) * 0.25 + 1$$

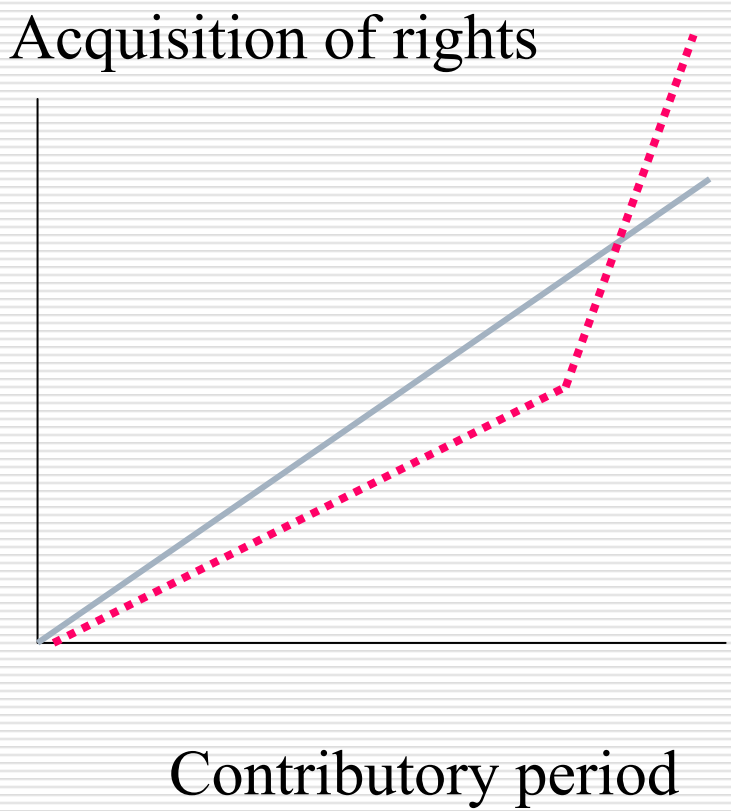
# The implicit weight of life expectancy

- Germany : in the long run pensions will increase like gross wages ; in the transition period like net wages minus demographic drift
- Life expectancy appears implicitly :

*Retirees in t = life exp. in t * workers in t-1*

# Actuarial fairness: from incentives to NDC

- Actuarial fairness at margin provides incentives to postpone retirement
- Actuarial fairness at level: discounted sum of contributions is equal to discounted sum of benefits

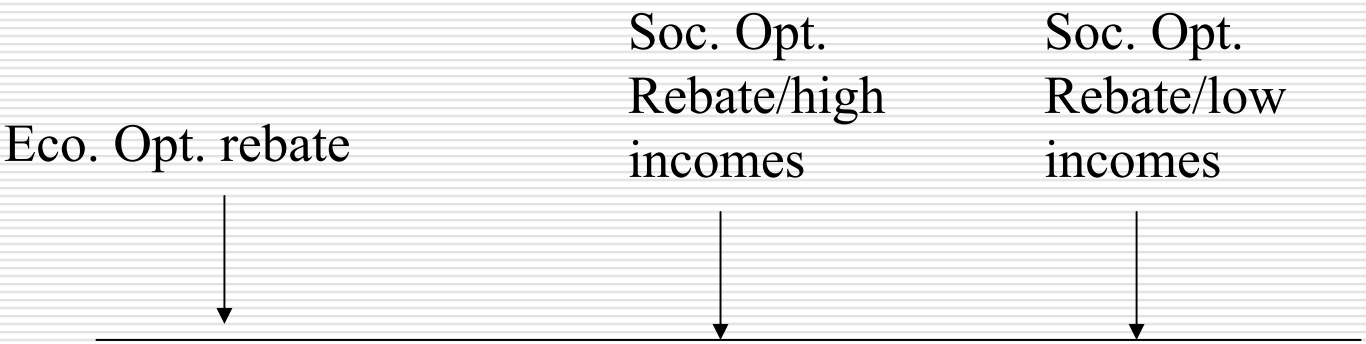


# Actuarial fairness at margin:

- AF rebate - indexing rules
- High values even if no leisure (costly)
- Individuals ’ preferences - life expectancy
- depends of the wage if Beveridgian elements
- no ceilings.

# Actuarial fairness at margin and life expectancy

## …How to pool ?




Life expectancy when 60, France.

| Category | Males | Females |
|---|---|---|
| Executives, self employed | 22.5 | 26.0 |
| Intermediate profession (technicians, etc.) | 19.5 | 25.0 |
| Artisan, shopkeepers, firms managers | 19.5 | 25.0 |
| Employees | 19.0 | 24.0 |
| Workers | 17.0 | 23.0 |

# Actuarial fairness in level

$$1+\rho_t = \frac{P^i{}_{t+1} * s_{t+1}}{\tau_t w_t}$$

$$s_t = \frac{\sum_i s_t^i}{N_t}$$

- Sum (contributions) = sum (benefits) for i
- Discount rate $\rho$ equal for all i
- RQs:
  - AF in level = FFS or NDC
  - No Beveridgian elements
  - No contributory ceiling

# Actuarial fairness in level: pure NDC

## Automatic stability?

$$E_{t+1} = R_{t+1} \Leftrightarrow E_{t+1} = \frac{s_{t+1}}{s_t}(1+g_t)\frac{\tau_t}{\tau_{t+1}}\frac{\sum_i w_t^i}{\sum_i w_{t+1}^i}R_{t+1}$$

- Pb of indexing device
- Pb of indexing ex-ante (forecasting)
- Optical illusion of the 2 periods model (life expectancy varies every year and pensions are computed once).

# French NDC: exogenous parameters

$$R_{t+1} = E_{t+1} \Leftrightarrow E_{t+1} = \frac{s_{t+1}^{j+1}}{s_t^j} * \frac{VP_{C+A+1}}{VP_{C+A}} \sum_{t=t_0}^{A} \frac{\tau_t / PP_t}{\tau_{t-1} / PP_{t-1}} * \frac{\sum_i \sum_t w_t^i}{\sum_i \sum_t w_{t-1}^{i-1}} * \frac{\tau_t \sum_i w_t^i}{\tau_{t+1} \sum_i w_{t+1}^{i+1}} * R_{t+1}$$

- Quick answer to shocks;
- Highly depends on forecasts
- Manipulating the parametes does not burden the same category

# Germany NDC: endogenous parameters

$$E_{t+1} = R_{t+1} \Leftrightarrow E_{t+1} = \frac{s_{t+1}}{s_t}(1+g_t)\frac{\tau_t}{\tau_{t+1}}\frac{\sum_i w_t^i}{\sum_i w_{t+1}^i} R_{t+1}$$

$$1+g_t = \frac{\overline{w}_t * x - \overline{P}_t * s_t / (1+n_{t-1}) + T_t / N_t}{\overline{w}_{t-1} * x - \overline{P}_{t-1} * s_{t-1} / (1+n_{t-2}) + T_{t-1} / N_{t-1}}$$

A return spring... $\left.\begin{matrix}\tau_t \\ \tau_{t-1}\end{matrix}\right\} \rightarrow 1+g_t \rightarrow VP_{t+1} \rightarrow E_{t+1} \rightarrow \tau_{t+1} \rightarrow g_{t+1}$

… but a questionable automatic stability

# A questionable automatic stability

- Even if the life expectancy is now « nearly explicit » in the formula ;
- Even if the burden is directly and explicitely shared by both the contributors and the retirees ;
- The fiscal funding of the PAYG remains possible.

# Nobody ’s perfect

A ideal NDC is:

- redistributive
- provides incentives to work later
- automatic stability

Difficulties:

- Different life expectancies
- Not pure NDC
- Use of forecasts:
  - yearly changes
  - if changes, AF is broken
  - pessimistic assumptions ?
  - Unfairness
  - Need a buffer fund.

Why NDC? Individual responsibility = FFS;

Social responsibility = NDC