Pension scheme design under short term fairness and efficiency constraints

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IAA LIFE Colloquium

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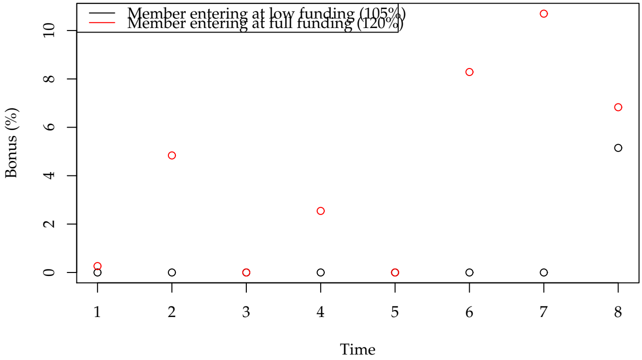
Munich

The problem

- *Systematic* redistribution of funds between generations in mutually owned with-profits pension schemes.
- Problematic as seen from an *altruistic* board's point of view.
- At odds with the *principle of contribution*.
- Previous studies: Døskeland and Nordahl (Geneva, 2008).

"It's all about the bonus"



(Bonus given when the scheme is *sufficiently* solvent.)

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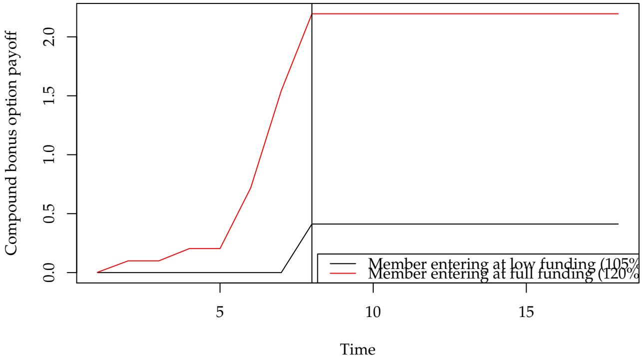

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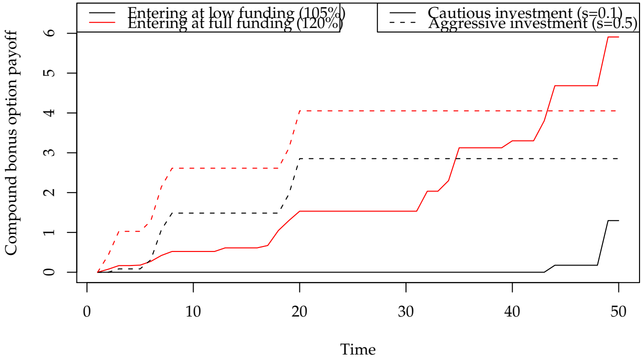
The impact of investment aggressiveness.



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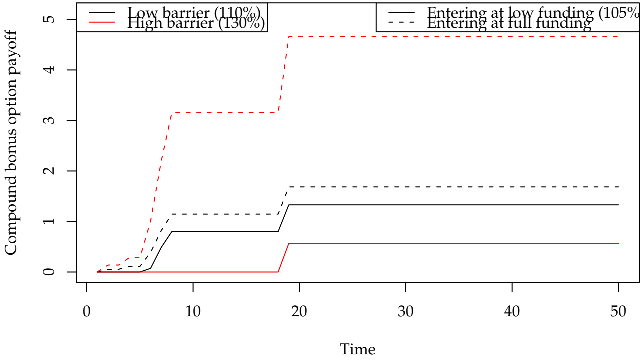
Are higher barriers better?



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- Design parameters are the bonus barrier κ and the investment aggressiveness $s \triangleq \alpha\sigma$.

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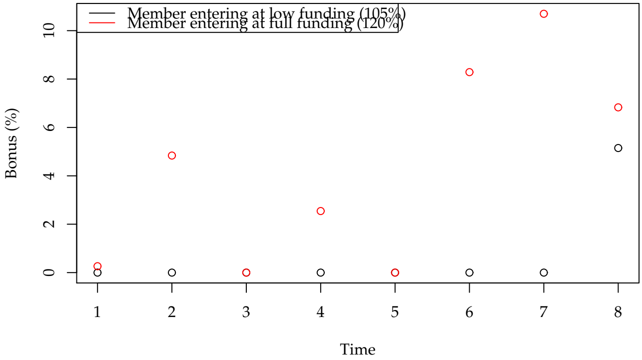

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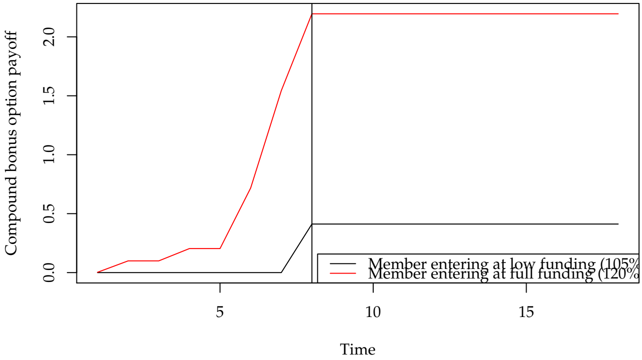

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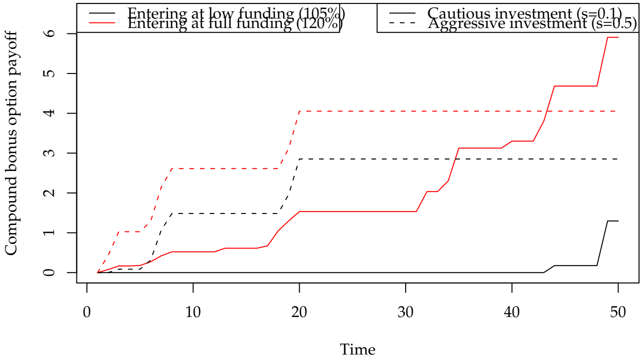

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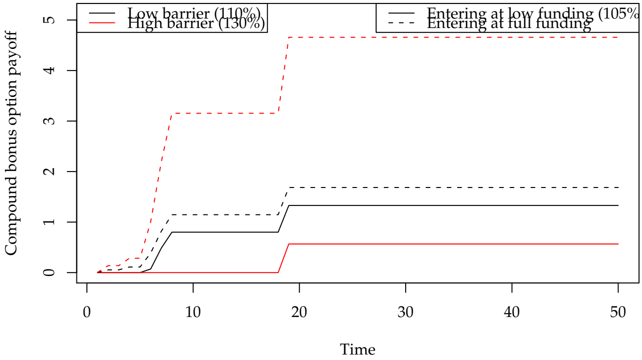

Properties of bonus frequency

- Entering at *full* funding: Bonus *frequency* decreases as s increases (κ is irrelevant).
- Entering *below* full funding: Bonus *frequency* decreases as κ increases. At very low initial funding, bonus frequency is maximised with moderately aggressive investment strategies. At initial funding closer to κ, bonus frequency is maximised with cautious investment strategies.

Properties of conditional bonus

Conditional bonus increases as s and κ are increased.

Conflicting interests

Lucky entrants	Unlucky entrants
Cautious investment High barriers	Aggressive investment Low barriers
Redistributing design	Inefficient design

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Fairness:

$$\mathbb{P}\left(\frac{X(s,\kappa,f)}{X(s,\kappa,\kappa)} > 1-\delta\right)$$

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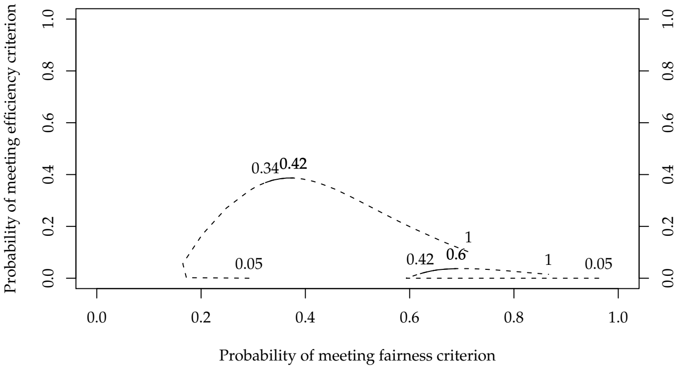
Efficiency:

$$\mathbb{P}\left(\frac{X\left(s,\kappa,\kappa\right)+X\left(s,\kappa,f\right)}{\max_{\bar{s},\bar{\kappa}\in\mathcal{S}\times\mathcal{K}} CE\left(\gamma;X\left(\bar{s},\bar{\kappa},\bar{\kappa}\right)+X\left(\bar{s},\bar{\kappa},f\right)\right)} > 1-\beta\right)$$

An illustration



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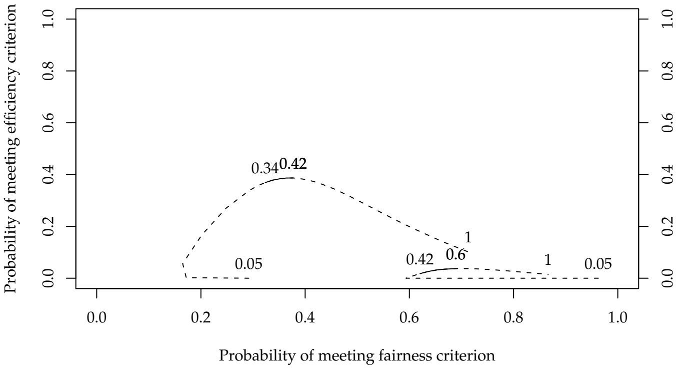

Letting the initial low funding depend on the investment strategy implies optimal investment strategies that are much more cautious!

A solidary tranformation rule

Funding	NPV(Benefit)$= 1/F$
105%	.95
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This overcomes *systematic* redistribution, if the barrier is low. If, in addition, investment is not too aggressive, redistribution is very modest. Such design is a reasonable compromise between the interests of the involved parties, although a rather low barrier is not long-run desirable.

"So, it's *NOT* all about the bonus!?!"