

Some Good News About an Ageing Workforce

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1. The Macro Costs of Ageing

The macroeconomic costs of ageing depend on what happens to:

- (i) labour productivity
- (ii) employment to population rate (the support ratio)

$$\frac{Y}{N} = \frac{Y}{L} \frac{L}{N}$$

Y	output
N	population
L	labour force

$$\frac{Y}{N} = \frac{Y}{L} \frac{L}{N}$$

Y/L driven by:

- technical progress due to innovation
- capital deepening
- human capital creation
- economies of scale
- **age mix of workforce ??**

$$\frac{Y}{N} = \frac{Y}{L} \frac{L}{N}$$

L/N driven by labour supply and demand:

- human capital
- tax & welfare policy
- superannuation policy
- longevity and "healthy ageing"
- discrimination eg age

Policies to boost employment of older workers

- On supply side (LFPR):
 - superannuation and pension reforms
 - welfare reform e.g. disability benefits
 - careers counseling for older workers
 - policies to promote healthy ageing
 - establishing a culture of older workers

Policies to boost employment of older workers

- On demand side:
 - courses to upgrade skills
 - financial assistance with training courses
 - changing attitudes towards older workers
 - (through education, discrimination laws)

2. Question

Can the effect of ageing on labour productivity (Y/L) be, in turn, affected by the degree of substitutability of labour by age ?

Most (all?) macro models assume that workers of different ages are perfectly substitutable
i.e. once adjusted for productivity they are identical labour inputs

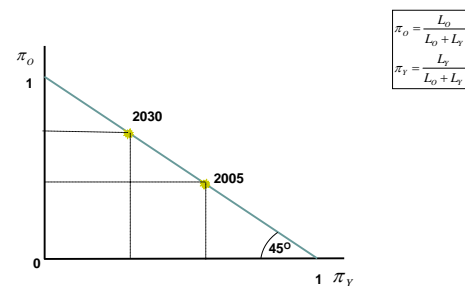
What about complementarities ?

- mentoring of younger workers by older workers?
- experience (with age) and dynamism (of youth)?
- physical strength of young male workers and people skills of older workers and females?

3. Is there an optimal age mix ?

- Suppose there are two types of workers:
 - LY : young workers
 - LO : old workers
- If young and old workers are equally productive and perfectly substitutable, an older workforce would have no effect on output.

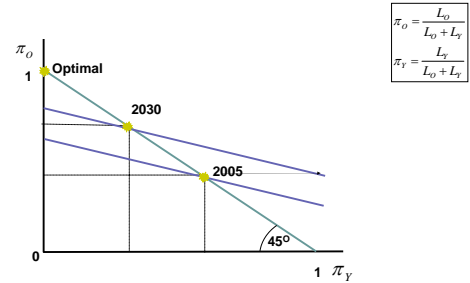
3. Is there an optimal age mix ?



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- If old workers are more productive than, but still perfectly substitutable with, young workers, then an older workforce would imply a larger output.

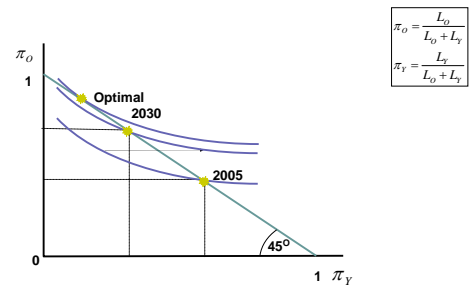
3. Is there an optimal age mix ?



3. Is there an optimal age mix ?

- If old workers are more productive than, but **imperfectly** substitutable with, young workers, then an old workforce **could** imply a larger output.

3. Is there an optimal age mix ?



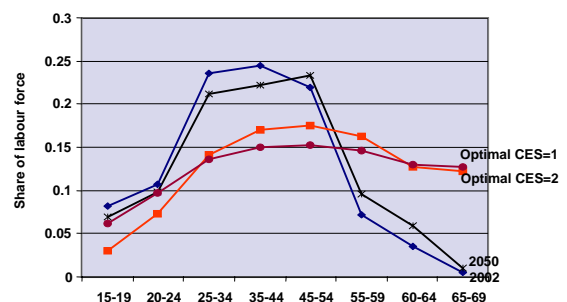
Prskawetz and Fent (2004) :

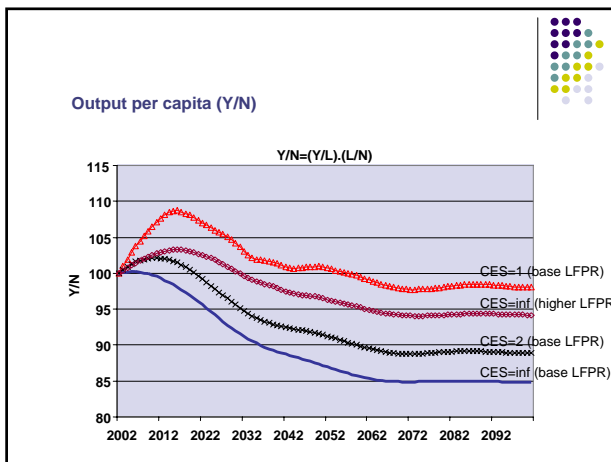
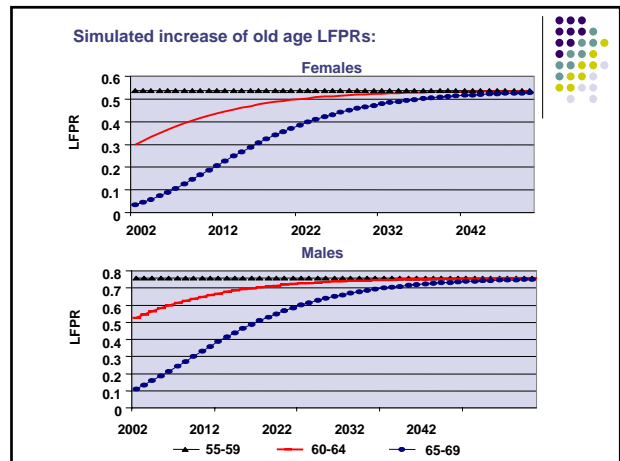
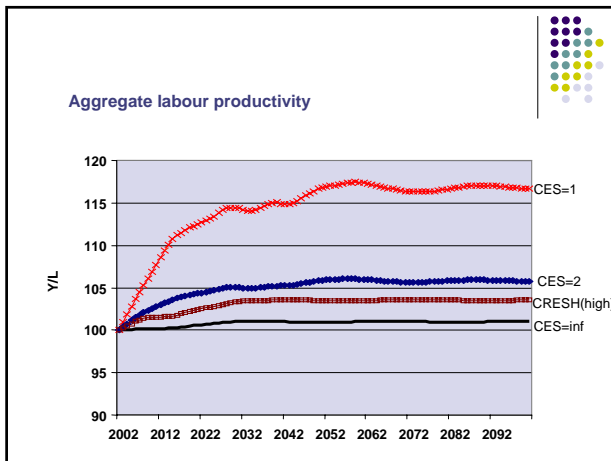
$$\frac{\pi_j}{\pi_i} = \left(\frac{L_{prod_j}}{L_{prod_i}} \right)^\sigma$$

σ is the elasticity of substitution between labour input i and j
 If workers of all ages are equally productive, then $\pi_j = \pi_i$
 Otherwise optimal age mix depends on relative productivities and σ

4. Simulation results for Australia

Age distribution of the labour force: actual (2002, 2050) and optimal





5. In Summary - What's the Good News?

- The costs of an ageing workforce can be offset by
 - increasing labour productivity (Y/L)
 - increasing LFPRs (L/N), esp. of older workers
- An older workforce may yield a dividend in terms of Y/L
- Size of dividend depends on how substitutable are older workers for younger workers
- Simulations for Australia indicate the dividend could be non-trivial in magnitude