MERCER

Human Resource Consulting

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Pensions – Delivering by design
Comparing pension outcomes from hybrid schemes

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Agenda

- Background

- Description of output

- Some outcomes based on fixed financial assumptions

- Illustration of risks faced by scheme members

- Some outcomes allowing for variability in investment returns

- 'Shocks'

- Comparison of different schemes

- Some conclusions

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Occupational pension scheme designs

Most common designs:

- Final salary

- Defined contribution

Compared with 'hybrid' designs:

- Career average

- Cash balance

- Cash balance with bonus

- Nursery

- DC top up

Risk

- Pre-retirement investment risk

- Post-retirement investment risk

- Longevity risk

- Salary risk

- Miscellaneous risks

- For employer:
  - Zero risk achieved by offering no pension scheme.
  - Final salary invested in equities scores 100

- How is each risk shared between employer and employee via choice of scheme?

Working lifetimes

working lifetimes

Salary histories

Sample salary scales (in real terms)
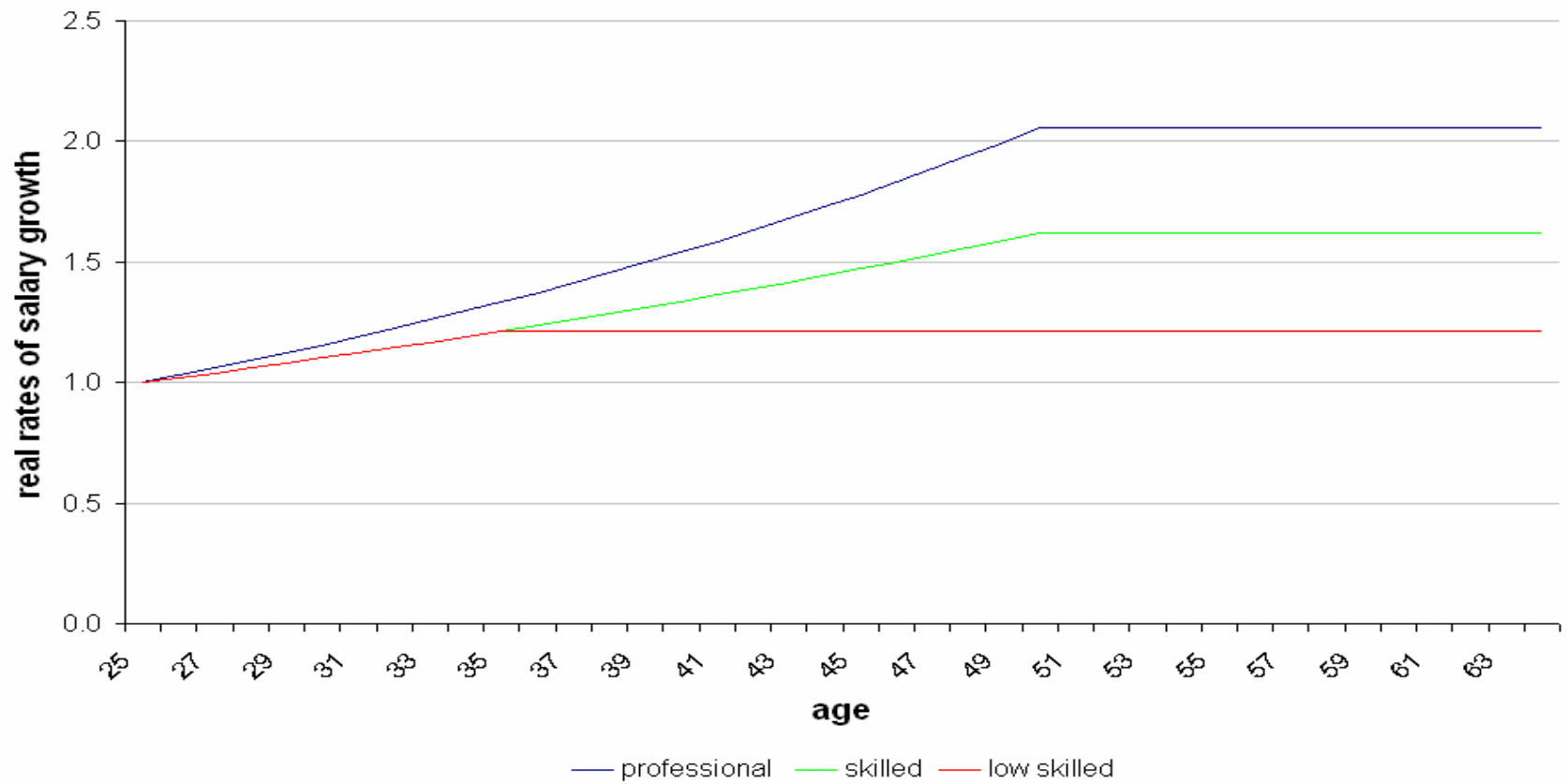
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Output

Comparison of the different ratios for various schemes and a 'part time with break' work history. A salary of £20,000 at a start age of 45. The retirement age is 65, salary increases are 'skilled' and investments are 100% bonds.

Legend: ■ Final pay ■ Revalued pay ■ Annualised final pay

Categories: final salary, defined contribution, career average, cash balance, nursery, DC top up
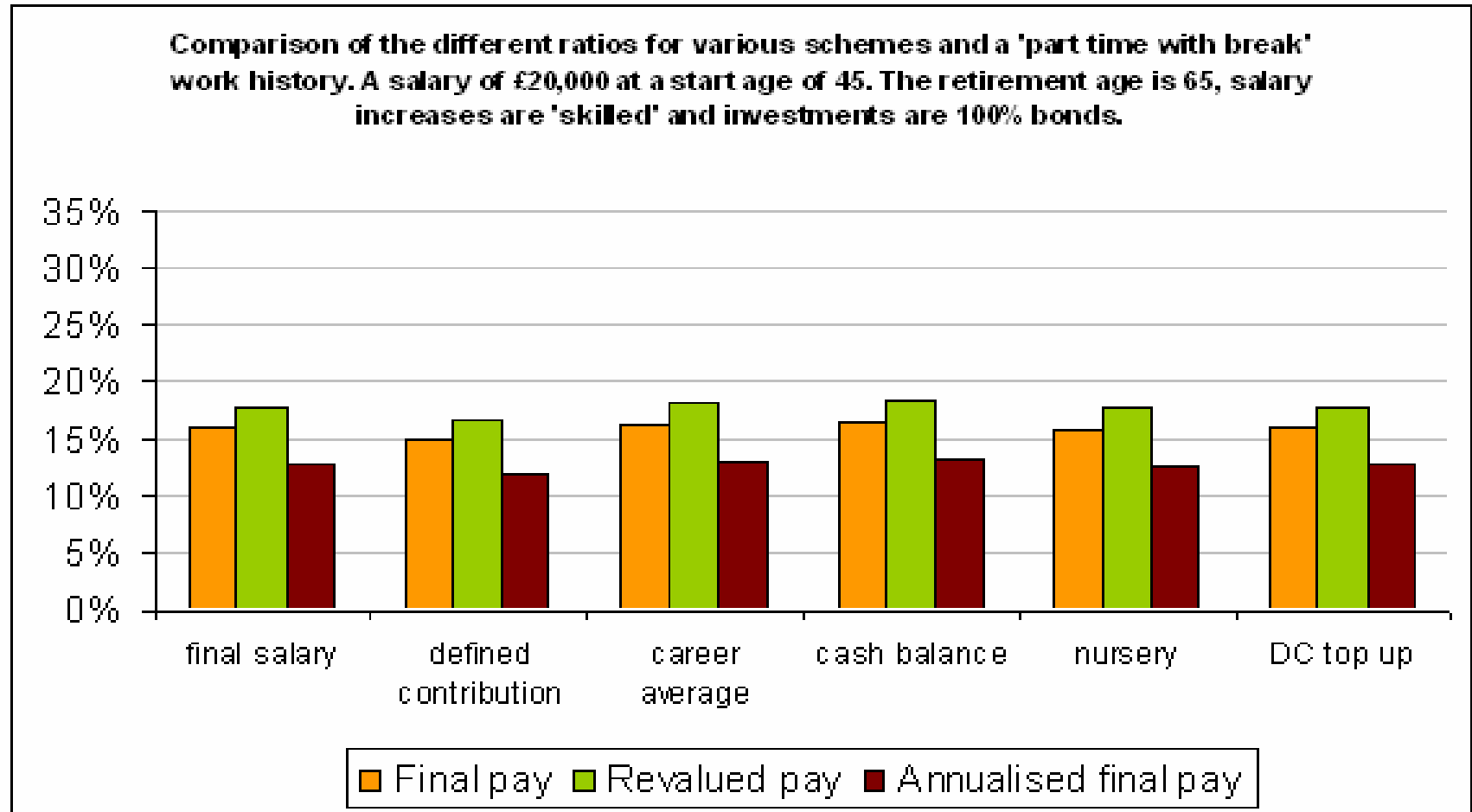
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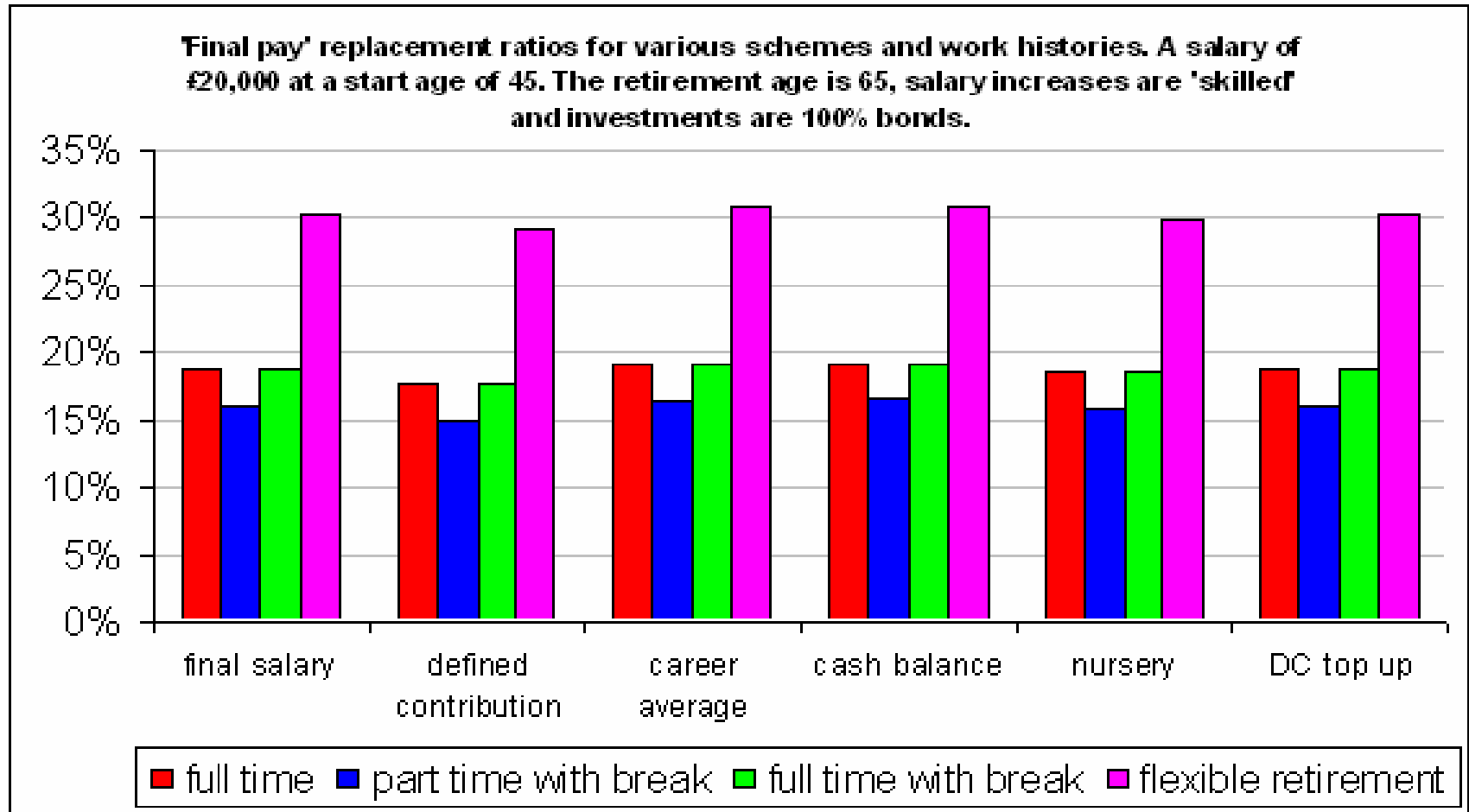- Comparison of different schemes

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Final Pay replacement ratios
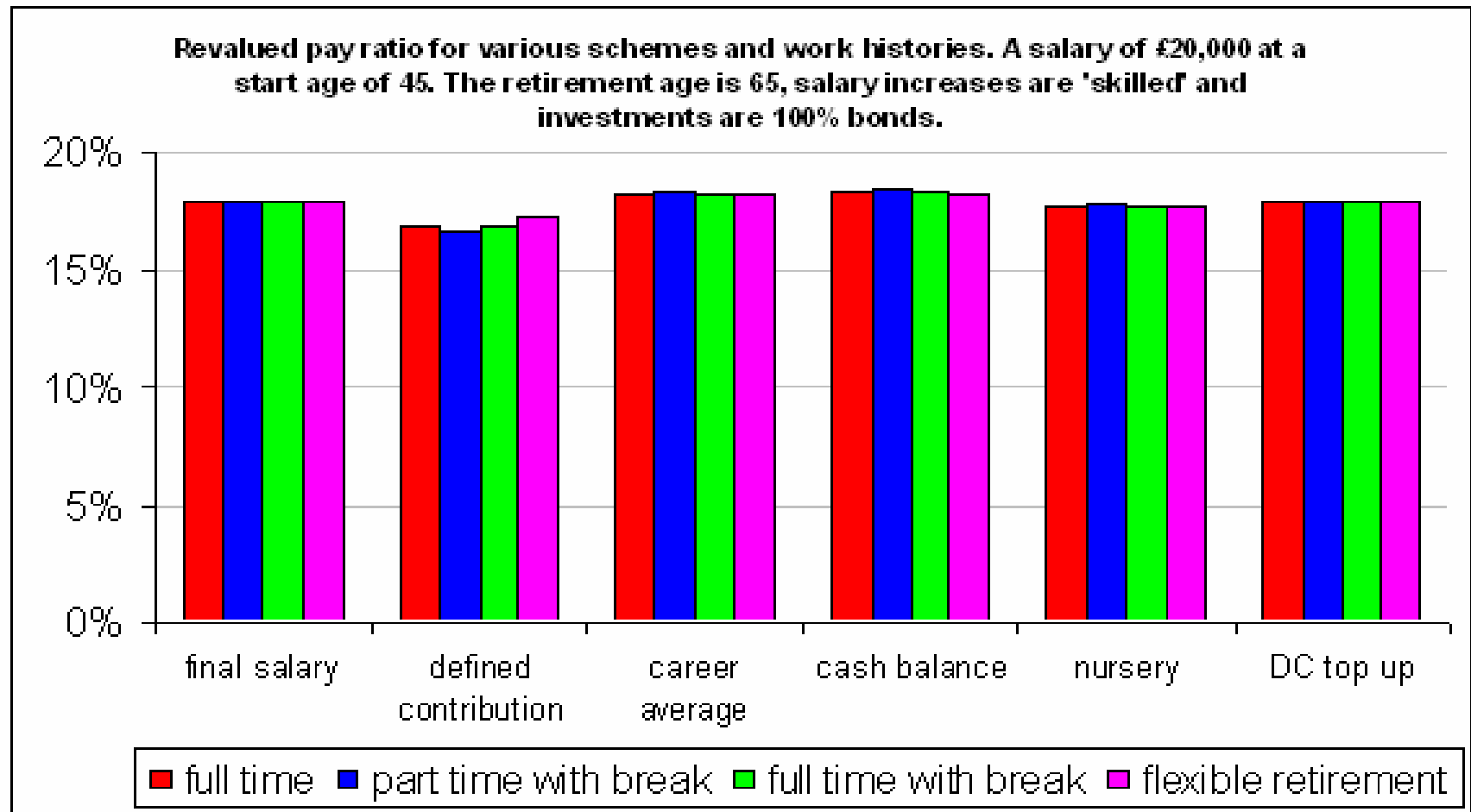## start age 45, 100% bonds

'Final pay' replacement ratios for various schemes and work histories. A salary of £20,000 at a start age of 45. The retirement age is 65, salary increases are 'skilled' and investments are 100% bonds.

Revalued pay replacement ratio
start age 45, 100% bonds

Revalued pay ratio for various schemes and work histories. A salary of £20,000 at a start age of 45. The retirement age is 65, salary increases are 'skilled' and investments are 100% bonds.

Legend: ■ full time ■ part time with break ■ full time with break ■ flexible retirement

Categories: final salary, defined contribution, career average, cash balance, nursery, DC top up

Revalued pay replacement ratio
start age 45, 50% bonds

Revalued pay ratio for various schemes and work histories. A salary of £20,000 at a start age of 45. The retirement age is 65, salary increases are 'skilled' and investments are 50% bonds.

Legend: full time · part time with break · full time with break · flexible retirement

Categories: final salary, defined contribution, career average, cash balance, nursery, DC top up
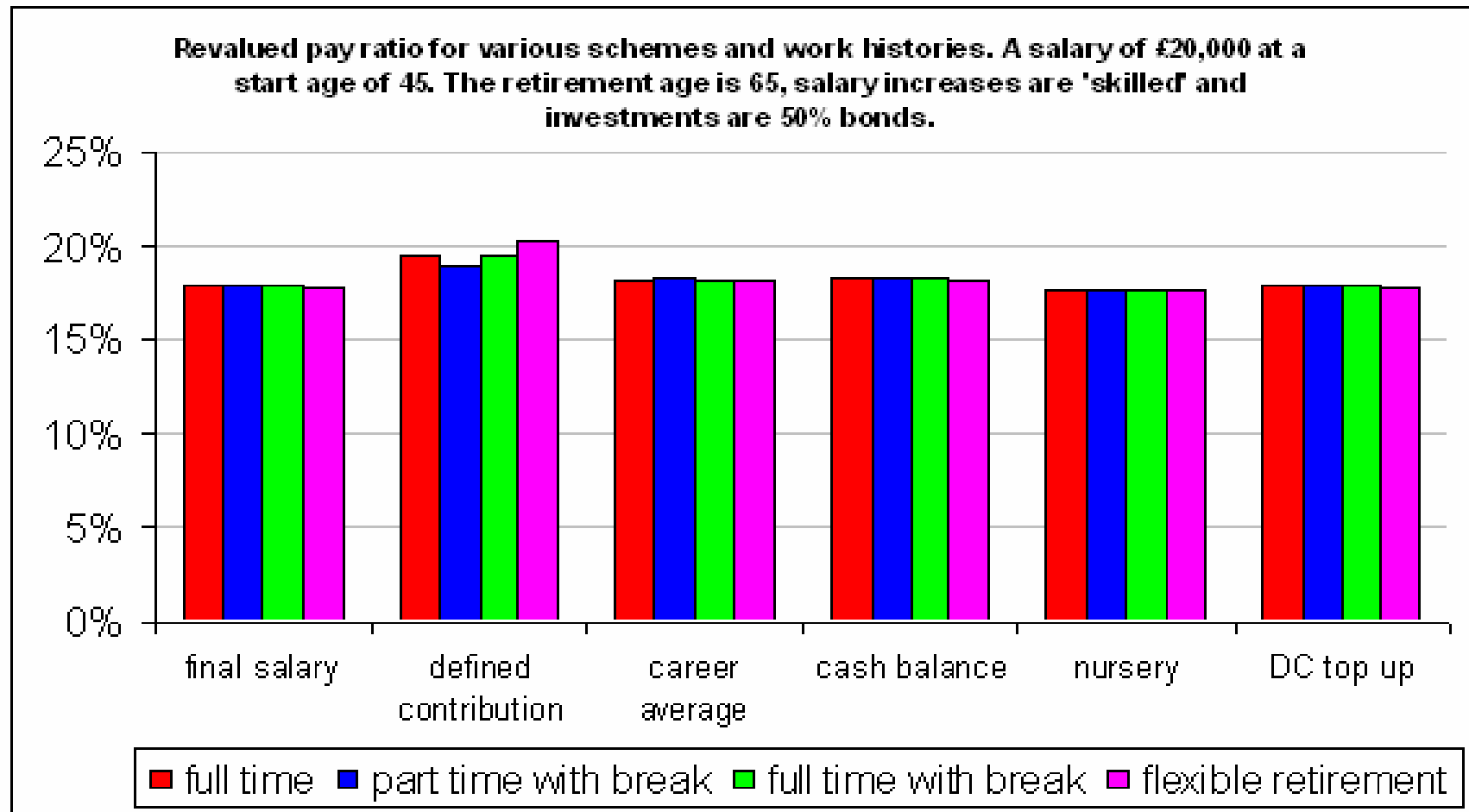
Revalued pay replacement ratio
start age 25, 50% bonds
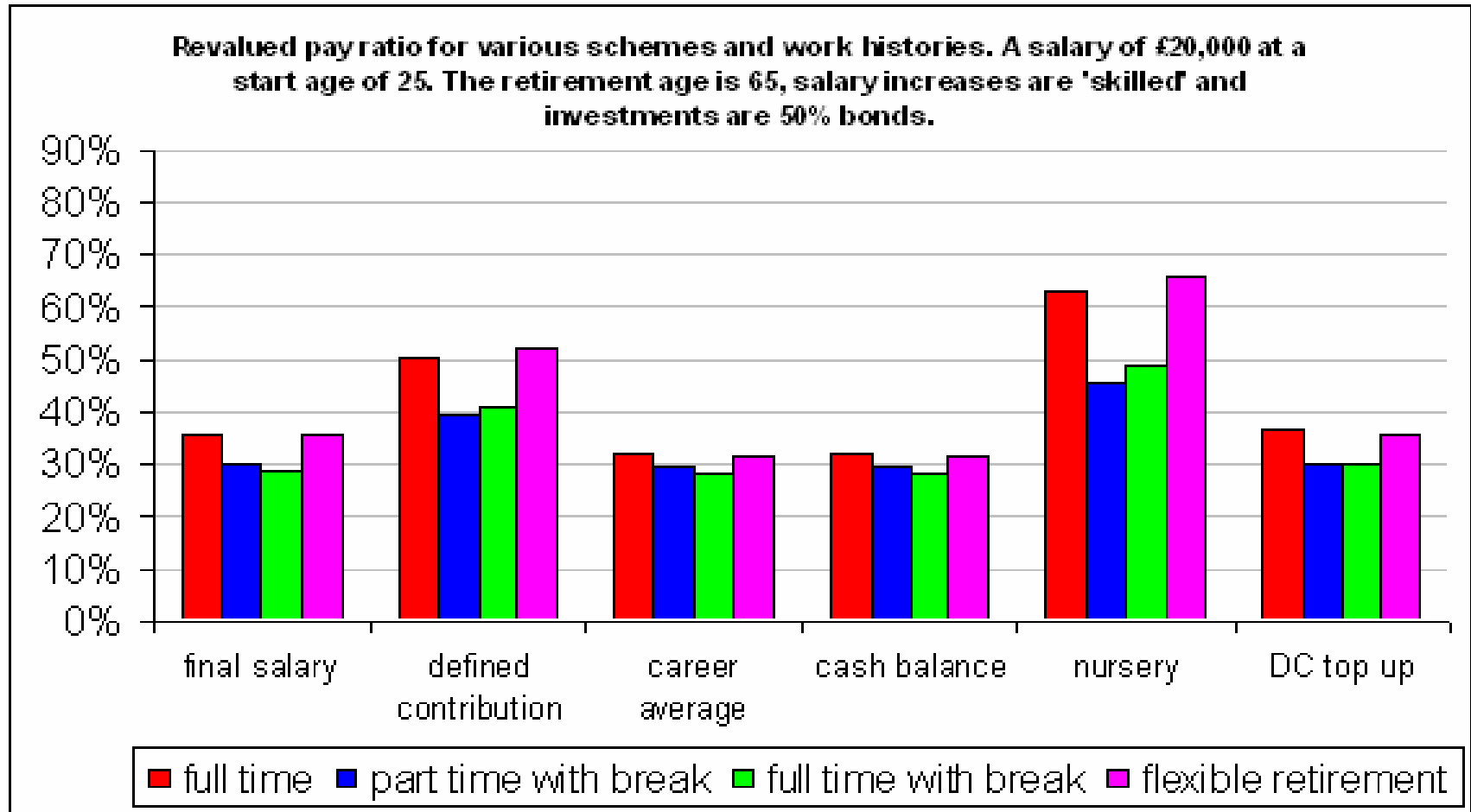
Revalued pay ratio for various schemes and work histories. A salary of £20,000 at a start age of 25. The retirement age is 65, salary increases are 'skilled' and investments are 50% bonds.

Legend: full time, part time with break, full time with break, flexible retirement

Categories: final salary, defined contribution, career average, cash balance, nursery, DC top up

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Risk to early leaver
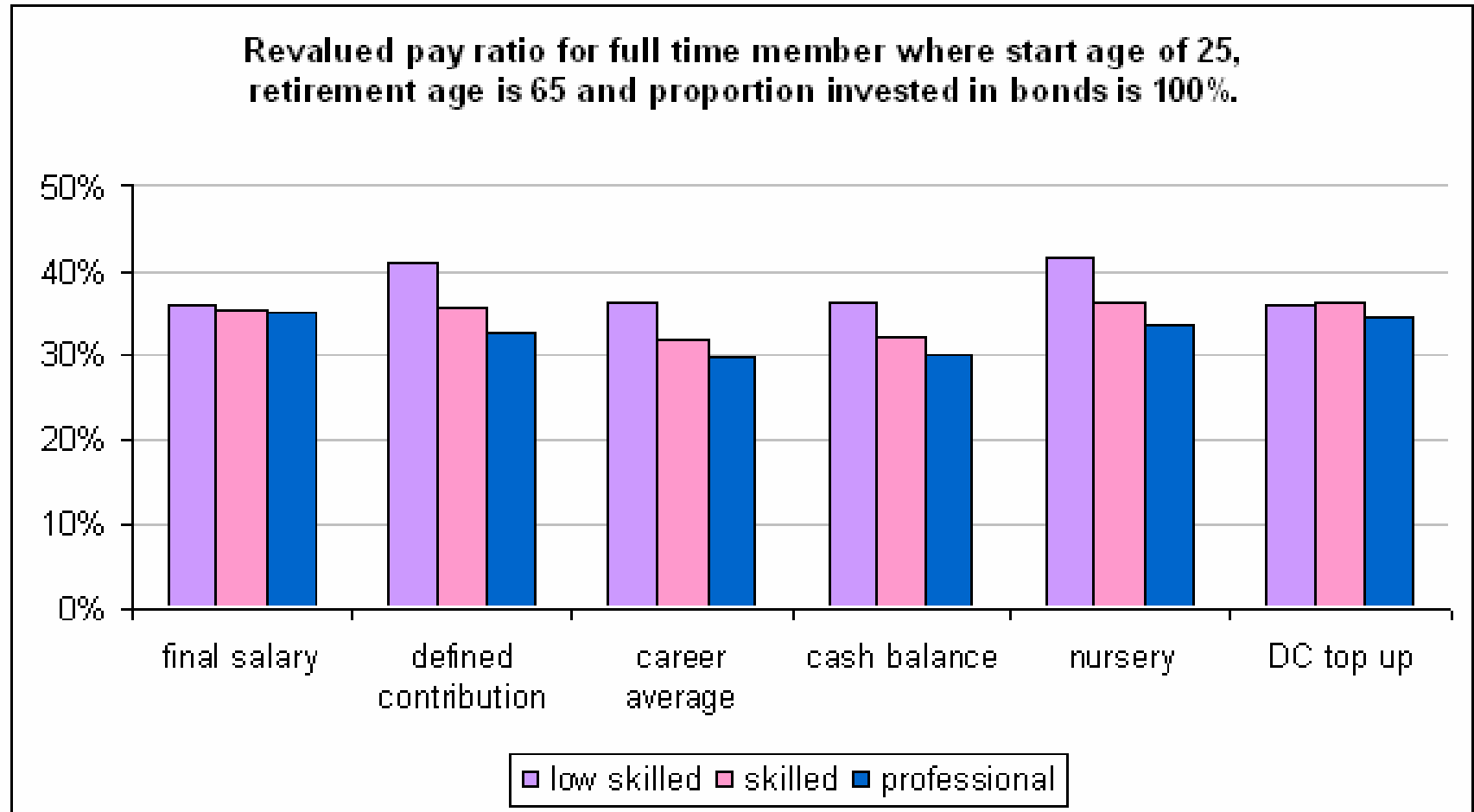

'Final pay' replacement ratios for final salary scheme and full time and deferred work histories. Start age of 25 and retirement age 65.

salary history

full time   deferred

Salary risk

Revalued pay ratio for full time member where start age of 25, retirement age is 65 and proportion invested in bonds is 100%.
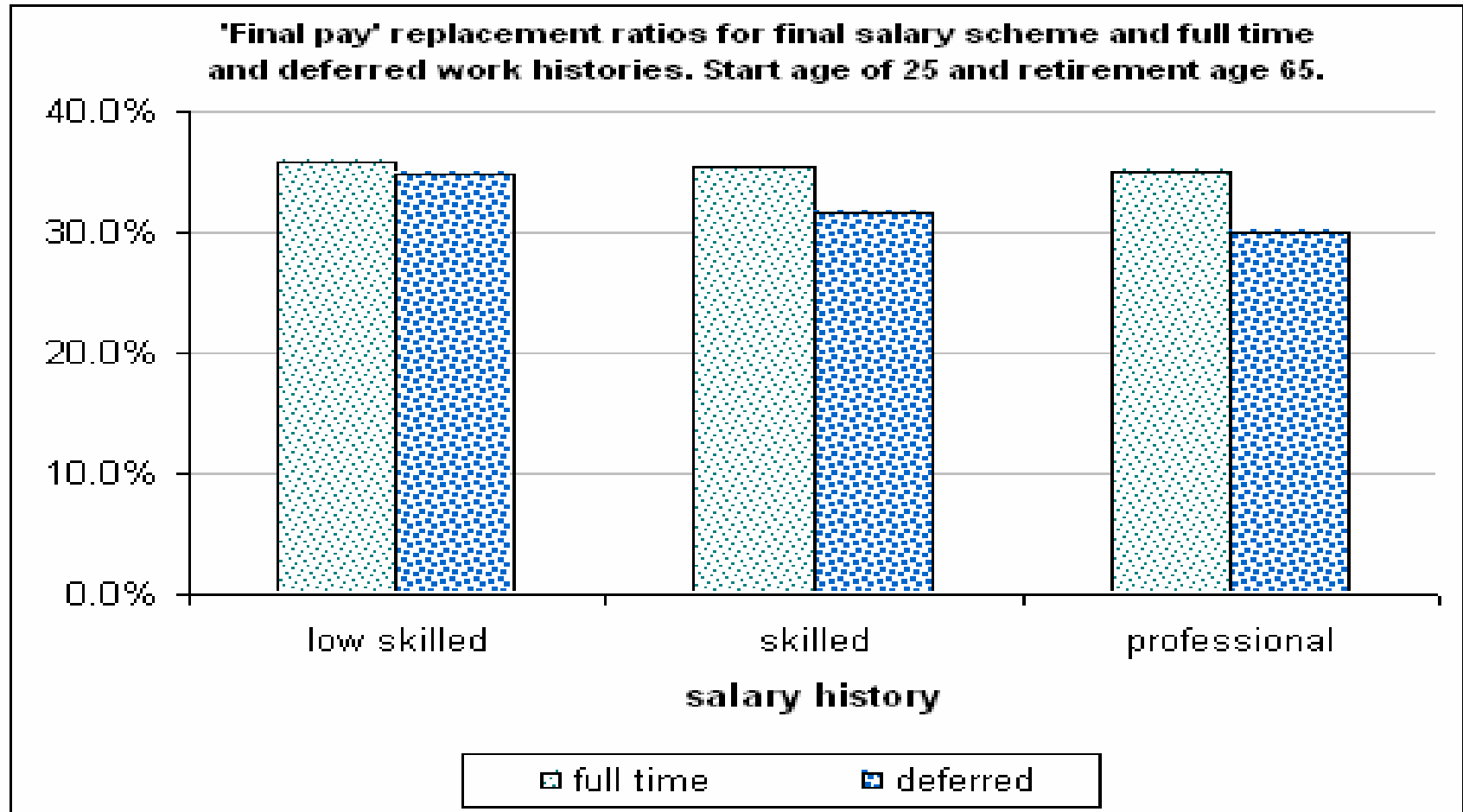
Gross and net replacement ratios

'Final pay' replacement ratios for various schemes and a 'full time' work history. Salaries of £20,000 and £40,000 at a start age of 25. The retirement age is 65, salary increases are 'skilled' and investments are 50% bonds.

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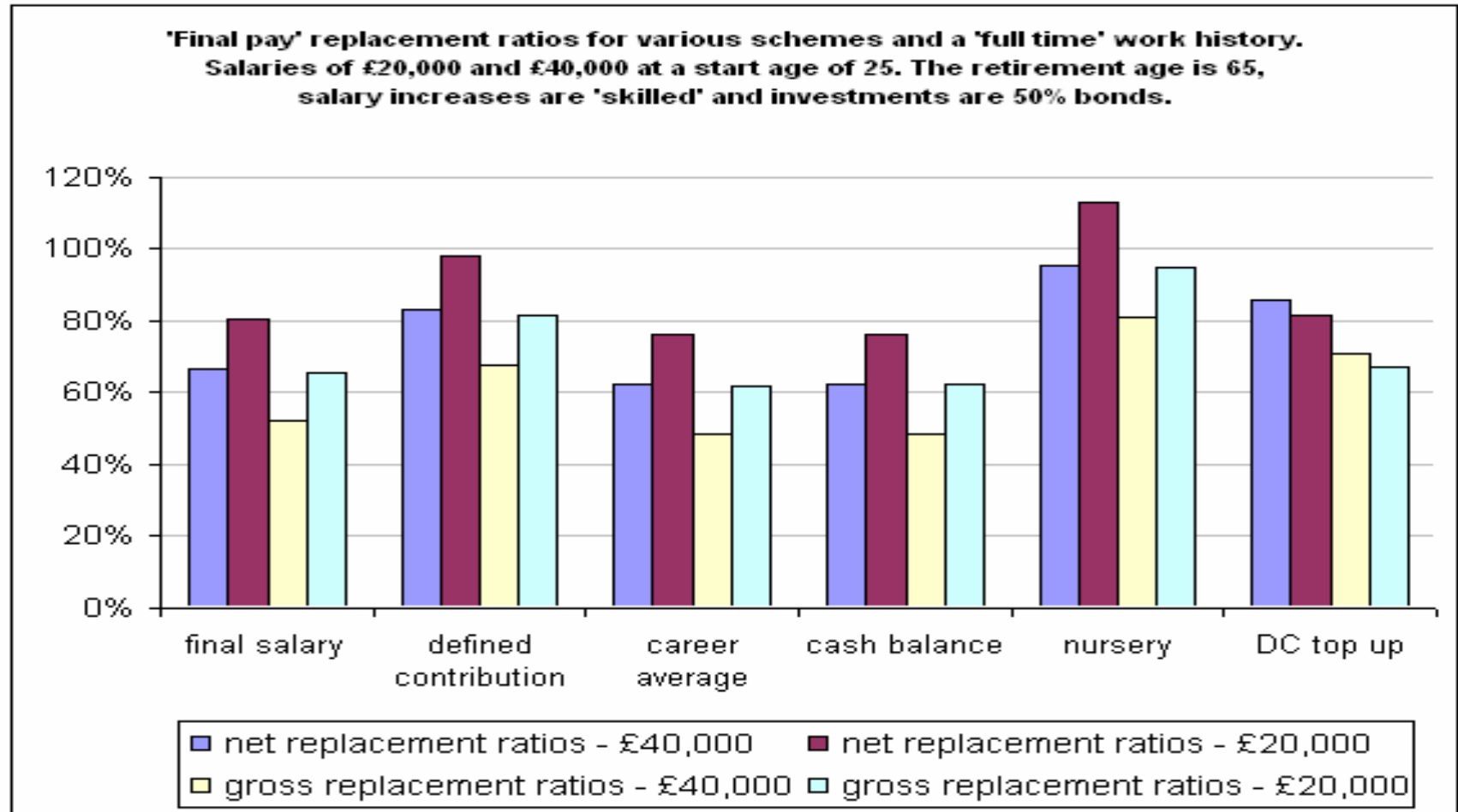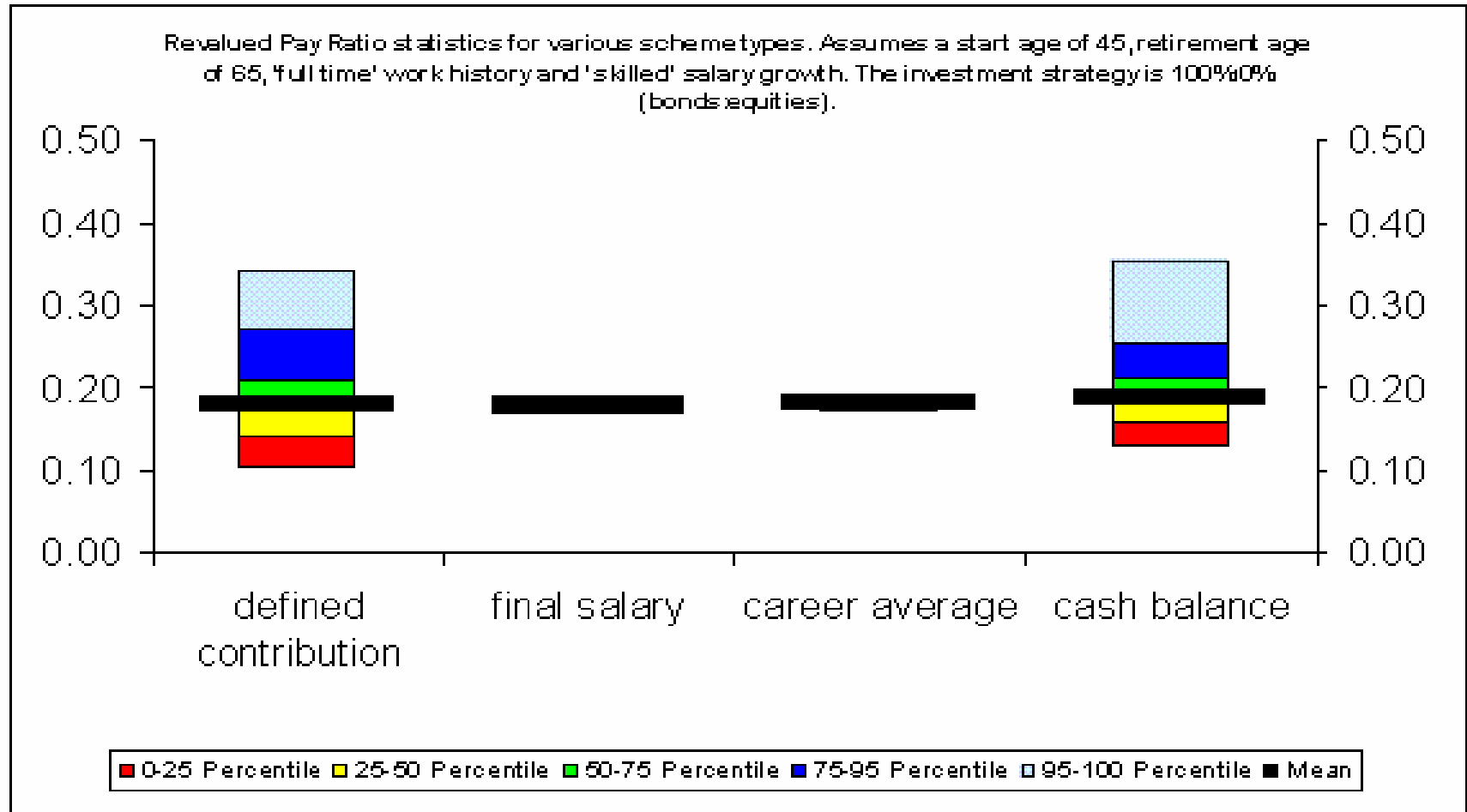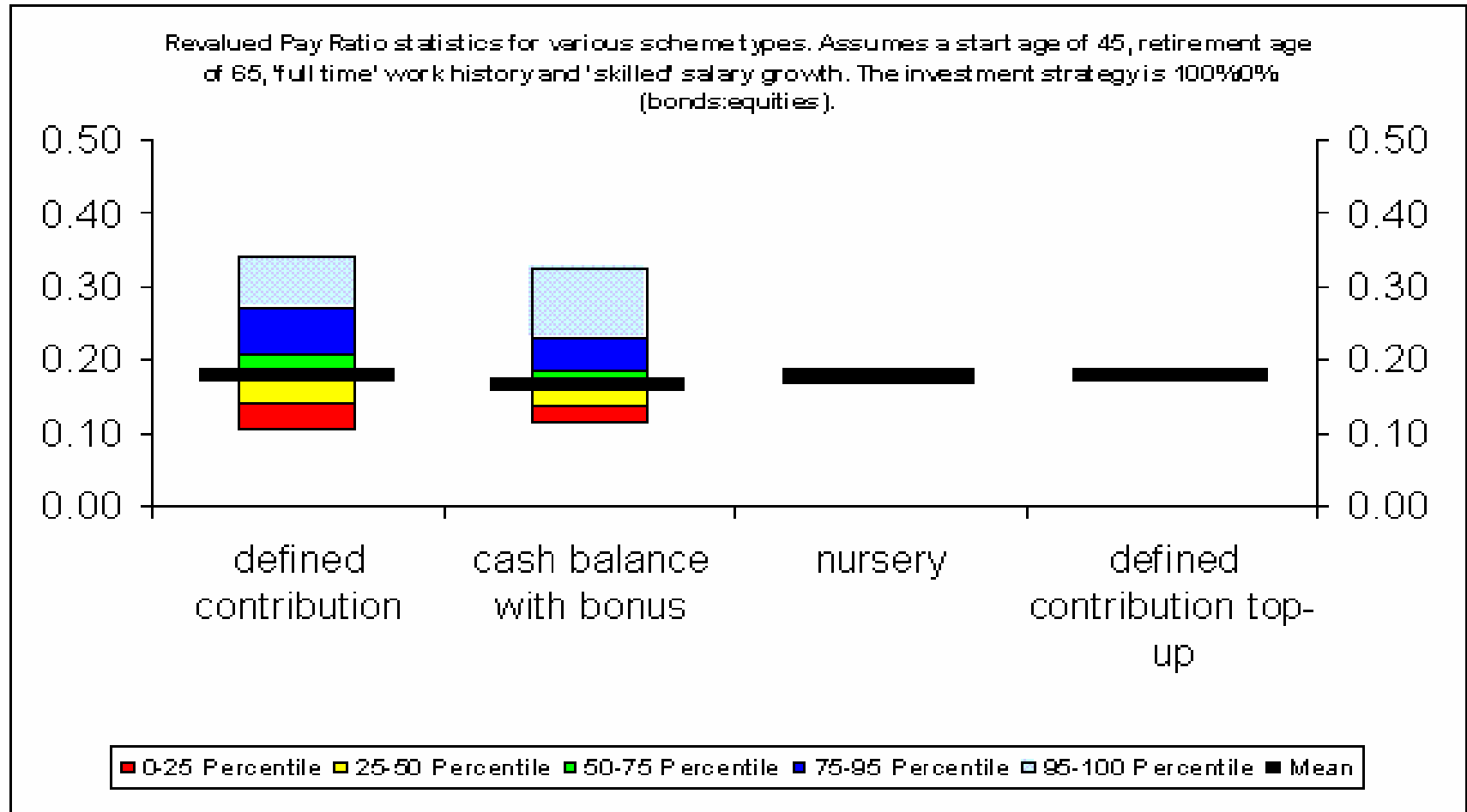- Comparison of different schemes

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Stochastic output
start age 45, 100% bonds

Revalued Pay Ratio statistics for various scheme types. Assumes a start age of 45, retirement age of 65, 'full time' work history and 'skilled' salary growth. The investment strategy is 100%/0% (bonds:equities).

Legend: ■ 0-25 Percentile ■ 25-50 Percentile ■ 50-75 Percentile ■ 75-95 Percentile □ 95-100 Percentile ■ Mean

X-axis: defined contribution | final salary | career average | cash balance

Stochastic output
start age 45, 100% bonds

Revalued Pay Ratio statistics for various scheme types. Assumes a start age of 45, retirement age of 65, 'full time' work history and 'skilled' salary growth. The investment strategy is 100%:0% (bonds:equities).

Legend: ■ 0-25 Percentile ■ 25-50 Percentile ■ 50-75 Percentile ■ 75-95 Percentile ☐ 95-100 Percentile ■ Mean

Stochastic output
start age 25, 30% bonds

Revalued Pay Ratio statistics for various scheme types. A start age of 25, retirement age of 65, 'full time' work history and 'skilled' salary growth. The investment strategy is 30%:70% (bonds:equities).

Legend: 0-25 Percentile, 25-50 Percentile, 50-75 Percentile, 75-95 Percentile, 95-100 Percentile, Mean

Categories: defined contribution, defined contribution top-up, cash balance with bonus, nursery

Stochastic output
start age 25, 30% bonds

Revalued Pay Ratio statistics for various scheme types. Assumes a start age of 25, retirement age of 65, 'full time' work history and 'skilled' salary growth. The investment strategy is 30%:70% (bonds:equities).

Stochastic output
start age 25, 30% bonds

## Median and interquartile ranges for defined contribution scheme, start age 25, investment 30% bonds

Working history	Median revalued pay ratio	Interquartile range
Full time with break	0.41	0.22
Part time with break	0.42	0.21
Flexible retirement	0.54	0.34

Stochastic output
Probability of ruin

Probability 'final pay' replacement ratios are greater than 20% for various scheme types and working histories. Assumes a start age of 45, retirement age of 65 and 'skilled' salary growth. The investment strategy is 100%:0% (bonds:equities).
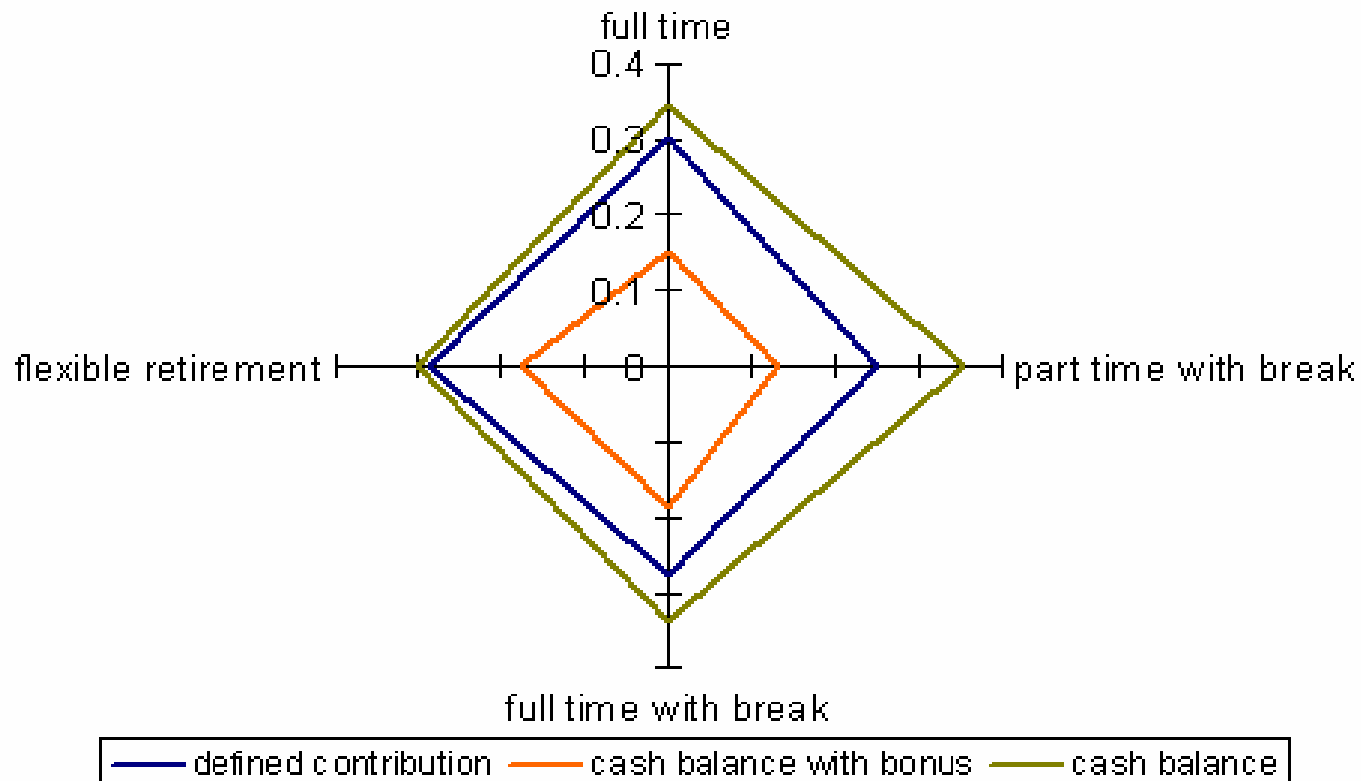
- defined contribution
- cash balance with bonus
- cash balance

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Shocks
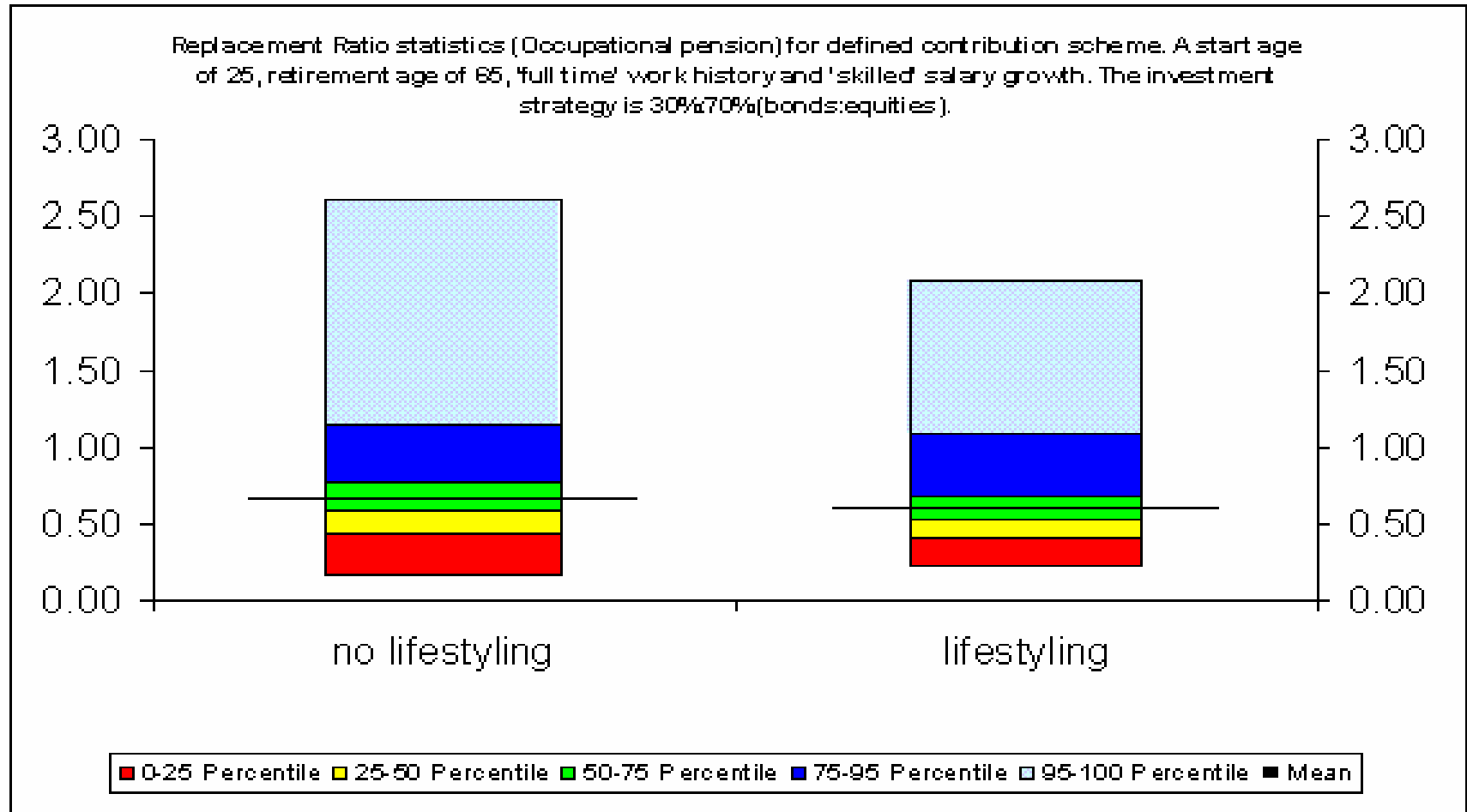## Cost of annuitisation

Annuity rates at age 65

Sex	PA92 base table rated by -3 years	PA92 medium cohort (YoB 1965)	PA92 long cohort (YoB 1965)
M	18.487	20.732	21.878
F	19.431	21.584	22.764

Sex	Real yield 1%	Real yield 2%	Real yield 3%
M	23.466	20.732	18.473
F	24.554	21.584	19.146

Shocks
Investment falls
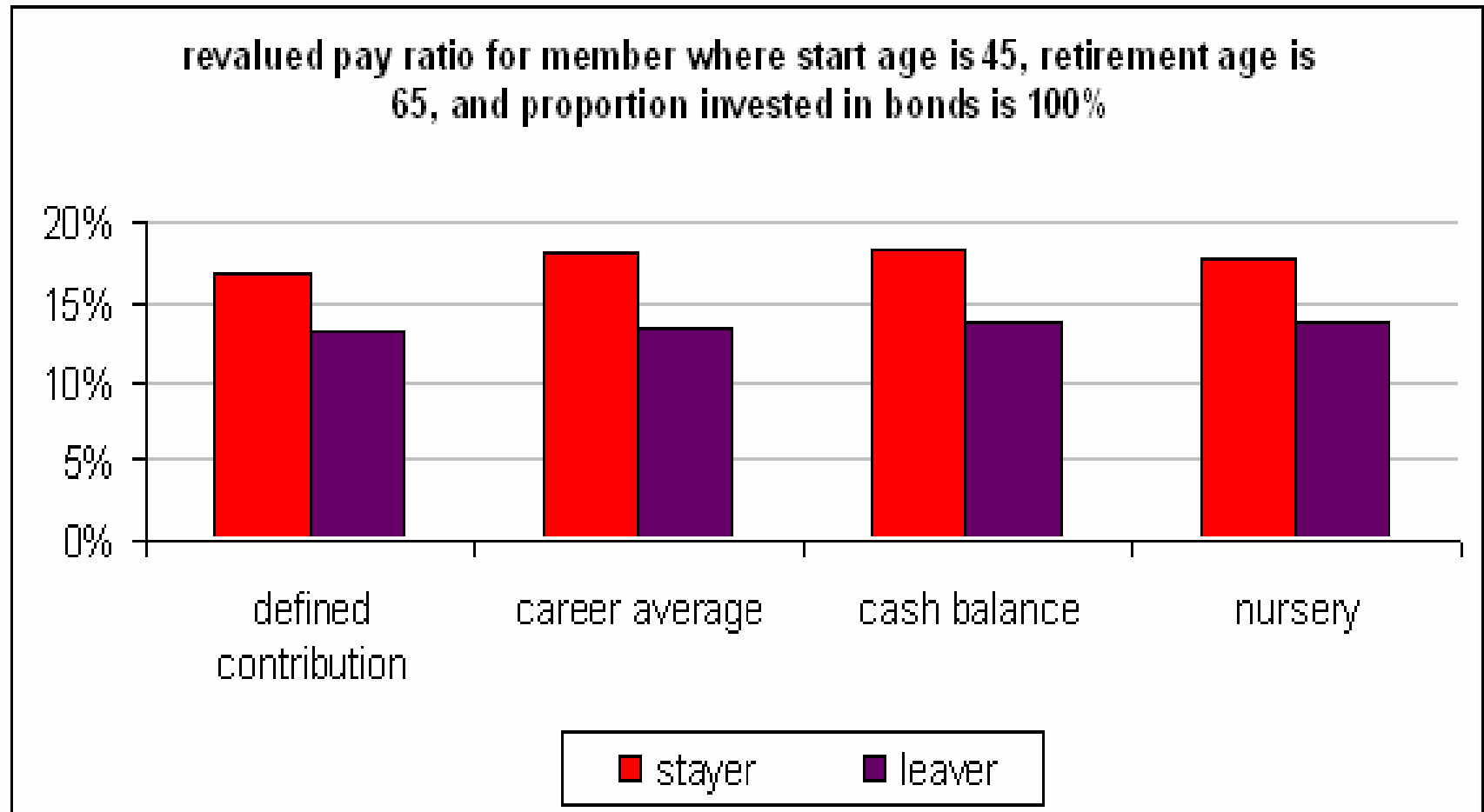
Replacement Ratio statistics (Occupational pension) for defined contribution scheme. A start age of 25, retirement age of 65, 'full time' work history and 'skilled' salary growth. The investment strategy is 30%:70%(bonds:equities).

Legend: ■ 0-25 Percentile ■ 25-50 Percentile ■ 50-75 Percentile ■ 75-95 Percentile □ 95-100 Percentile ■ Mean

Shocks
Scheme closure

revalued pay ratio for member where start age is 45, retirement age is 65, and proportion invested in bonds is 100%
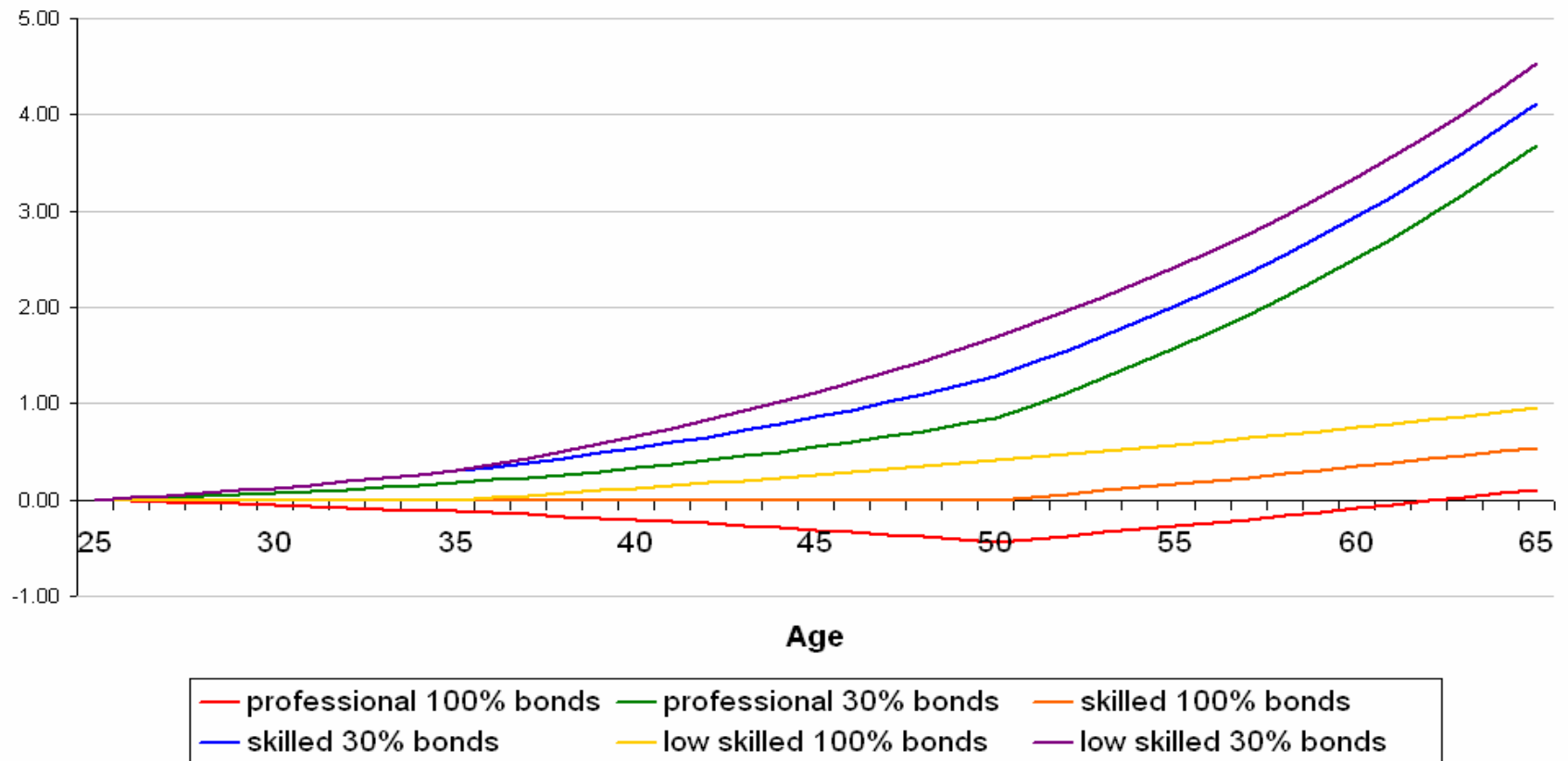
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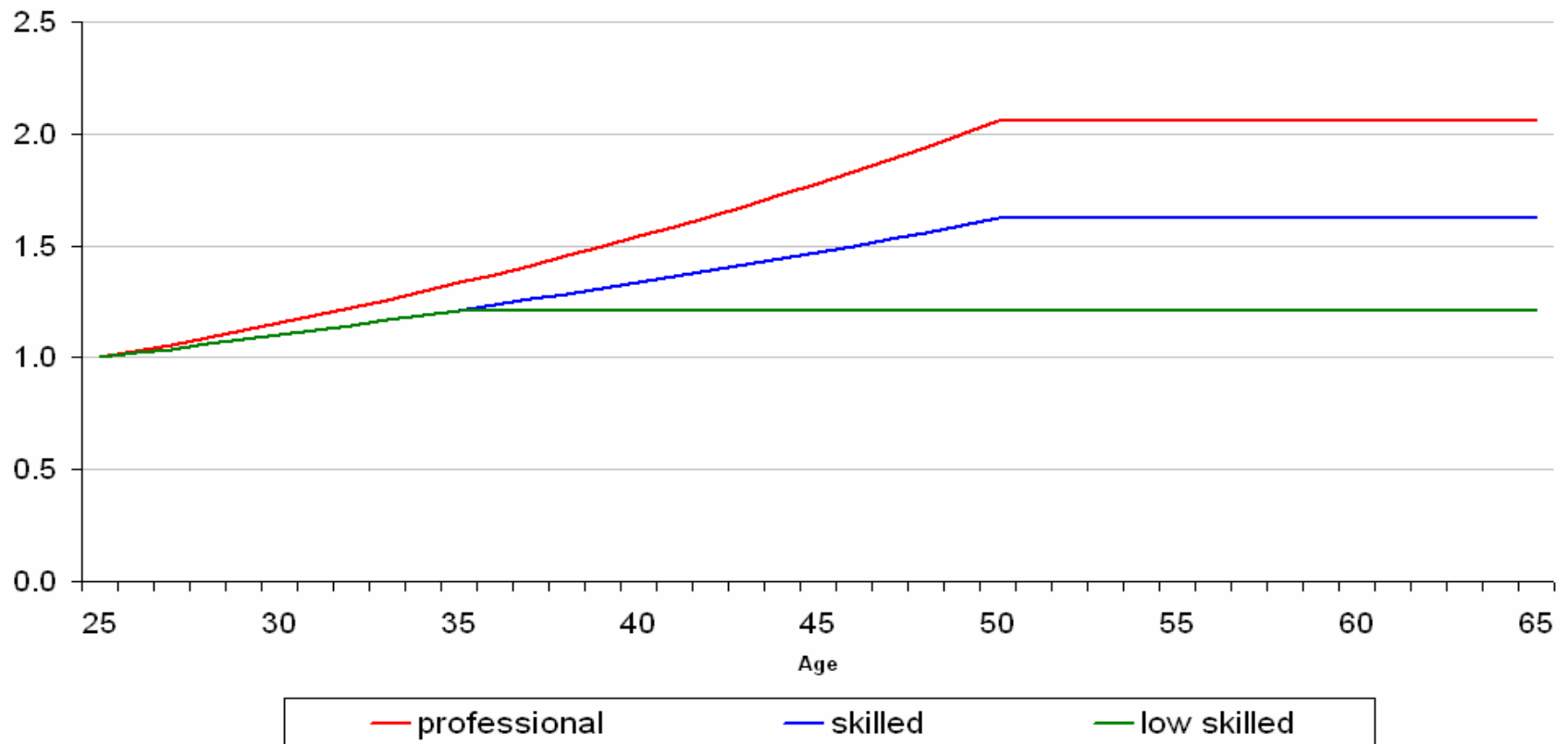# Value of different schemes
Defined contribution

'Real' returns from defined contribution scheme

Legend:
- professional 100% bonds
- professional 30% bonds
- skilled 100% bonds
- skilled 30% bonds
- low skilled 100% bonds
- low skilled 30% bonds

Age

Value of different schemes
Career average/Cash balance

Real salary growth

Legend: professional — skilled — low skilled

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(Some) Conclusions

- Defined contribution provides best outcomes in most cases, but …
    - … also highest probability of worst outcome.

- Cash balance with bonus reduces probability of poor outcome, but …
    - … introduces administrative risks for employer/trustees.

- Mixed benefit schemes can target risk sharing:
    - Nursery places more risk on young employees
    - DC top up places more risk on high paid employees

- Employees' working histories will affect the value of some arrangements, particularly in DC schemes:
    - early contributions are most valuable;
    - phasing retirement increases variability of outcome.