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Pension scheme redesign and wealth redistribution between the members and sponsor: The USS rule change in October 2011

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HIGHLIGHTS

- This study quantifies the redistributive effects of a rule change by a real world scheme.
- Future members of USS lost 65% of their pension wealth.
- The sponsor's costs reduced by 26%, equivalent to £32 billion over 54 years.
- The riskiness of the pension wealth of future members increased by a third.
- The riskiness of the present value of the sponsor's future contributions reduced by 10%.

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ABSTRACT

The redesign of defined benefit pension schemes usually results in a substantial redistribution of wealth between age cohorts of members, pensioners, and the sponsor. This is the first study to quantify the redistributive effects of a rule change by a real world scheme (the Universities Superannuation Scheme, USS) where the sponsor underwrites the pension promise. In October 2011 USS closed its final salary scheme to new members, opened a career average revalued earnings (CARE) section, and moved to 'cap and share' contribution rates. We find that the pre-October 2011 scheme was not viable in the long run, while the post-October 2011 scheme is probably viable in the long run, but faces medium term problems. In October 2011 future members of USS lost 65% of their pension wealth (or roughly £100,000 per head), equivalent to a reduction of roughly 11% in their total compensation, while those aged over 57 years lost almost nothing. The riskiness of the pension wealth of future members increased by a third, while the riskiness of the present value of the sponsor's future contributions reduced by 10%. Finally, the sponsor's wealth increased by about £32.5 billion, equivalent to a reduction of 26% in their pension costs.

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On retirement the sponsor of a UK defined benefit (DB) pension scheme promises to pay a pension according to the rules of the scheme, regardless of the scheme's financial state. This appears to place all the risks (investment, interest rates, inflation, salaries, longevity, regulation, etc.) on the sponsor, who is usually the employer. But the sponsor can share these risks with active and future members of the scheme by altering the rules applying to future accruals. For example, a large deficit may lead to rule changes such as an increase in the members' contribution rate, the introduction of limited price indexation, a later retirement age, or a reduction in the accrual rate. Because UK law does not allow accrued benefits to be reduced, rule changes only apply to future accruals. This means that the youngest scheme members are the hardest hit by such action as they will be accruing benefits under the new rules for many years, while those near retirement are largely unaffected since their substantial accrued benefits are legally protected.

Before a rule change the various scheme participants have both accrued benefits and expectations of the net present value (NPV) of their future interactions with the scheme, i.e. contributions to

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be made and pensions to be received.[2] After a rule change these expectations are altered, and the difference between NPVs of the cash flows before and after the rule change for each age cohort quantifies the redistributive effect of the rule change. For example, an increase in the member contribution rate redistributes pension wealth from active and future members to the sponsor. Therefore a rule change leads to the redistribution of pension wealth and risk between the main groups of participant—the sponsor, active members, deferred members,[3] pensioners and future members.

When rule changes are proposed, attention usually focuses on the details of these changes such as contribution rates, accrual rates and retirement ages, but with no detailed valuation of the size of the wealth transfer. Almost no explicit consideration is given to the effects of a rule change on the wealth of the different age cohorts, or to the riskiness of this wealth, and these can be substantial. Therefore an important objective of this paper is to stimulate a greater awareness of the redistributive effects on wealth and risk of pension scheme redesign, particularly the generational effects. While this paper deals with a particular pension scheme and rule change, the methodology can be applied to investigate the redistributive effects of rule changes by other DB schemes where the sponsor remains responsible for meeting the pension promise, as in countries such as the UK and USA. It can also be used to investigate the long run viability of such DB pension schemes.

Previous investigations of the redistribution of pension wealth by rule changes have been of hypothetical schemes. This is the first paper to quantify the redistributive effects of a major package of rule changes by a large real-world DB pension scheme—the UK Universities Superannuation Scheme (USS). Almost all previous studies have been of hypothetical Dutch schemes where the sponsor has no obligation beyond paying a fixed contribution rate. Therefore the sponsor is not involved, and all the redistribution is between different generations of member, i.e. inter-generational redistribution. In 2011 USS was a 'balance of cost' scheme where, unlike Dutch schemes, the sponsor bears the default risk, and so any redistribution of wealth and risk is primarily between the sponsor and members.

To quantify redistribution stemming from the October 2011 rule change, a benchmark must be specified. One possible benchmark is to compute the 'true' funding position of USS in October 2011, and then to distribute any deficit among the sponsor and the cohorts of members and pensioners. However, there would be a considerable degree of uncertainty and subjectivity attached to such a benchmark. In October 2011 USS had a well-defined set of rules, the main features of which had remained unchanged since 1975, when USS began. Therefore a reasonable expectation for members in October 2011 was that the pension promises enshrined in the USS rules would be honoured, and so the benchmark we use is the pre-October 2011 scheme.

This paper incorporates many aspects of the problem not included in previous studies—lump sum payments on retirement, deferred pensioners, limited price indexation, spouses' pensions, increases in the retirement date, both final salary and career revalued benefits (CRB) sections, and consumer price indexation (CPI) of the accrued benefits of the CRB section active members and the accrued benefits of deferred pensioners, as well as pensions in payment. In addition, we compute final salaries using the retail price index (RPI), see Appendix A. This is also the first study of redistribution by a scheme moving to 'cap and share' contribution rates. We model the pension scheme for longer than a working lifetime to avoid the problem of back-loading, where contributions made when young represent worse value than those made when old.[4] If the effects of a rule change are quantified for a period shorter than a working lifetime, the presence of back-loading is likely to show that the young receive a less favourable outcome than the old. We also employ a dynamic asset allocation strategy by allowing the asset allocation to respond to the current funding ratio (assets/liabilities), rather than use a fix-mix investment strategy as have most previous studies. With 13 factors the vector auto-regression (VAR) model we use to forecast asset returns and inflation includes many more assets than previous studies, and is only the second study to include the three factors of the yield curve (level, slope and curvature) in the VAR model, rather than selected interest rates. Finally, we model the numbers of new active and deferred scheme members each year as stochastic processes.

Section 1 describes USS, and Section 2 outlines our methodology. Section 3 has a literature review, followed in Section 4 by details of the data and methodology used to forecast the yield curve, asset returns, inflation and academic salaries each period until the horizon date. Section 5 contains the procedure for forecasting the size of each age cohort, and Section 6 explains how the liabilities (i.e. the accrued benefits) of each age cohort are estimated at the end of each period. Section 7 then brings together all these forecasts to calculate the triennial values of the USS funding ratio, revisions to the member and sponsor contribution rates, and adjustments to the asset allocation. In Section 8 these are used to generate the cash flows to and from the various participants each time period until the horizon date. The NPVs of these cash flows are valued using stochastic discount factors (SDF) to give the redistribution of wealth generated by the October 2011 rule changes. The results appear in Section 9, with robustness checks in Section 10, where the use of riskless discount rates also permits estimates of the changes in risk.[5] Finally, Section 11 has the conclusions.

1. USS

In 2014 USS was the second largest pension scheme in the UK, and the 36th largest in the world with 316,440 active members, deferred pensioners and pensioners. It is a multi-employer scheme with 374 separate sponsors (or institutions), and assets valued at £42 billion in 2014. Until the rule change implemented in October 2011, USS was an open final salary scheme. In October 2011 USS was split into two sections—a final salary section that was closed to new members in October 2011, and a CRB section, which operates on a career average revalued earnings (CARE) basis, and started operation in October 2011. The rule changes in October 2011 were a matter of heated public controversy between the institutional sponsors of USS, represented by the Employers Pension Forum; and the members and pensioners of USS, represented by the University and College Union (UCU), leading to lengthy industrial action by members of the UCU.[6]

USS is a very large and complicated scheme with a 295 page rule book, and so any model of USS is bound to be a gross simplification. This study captures the financially important features of USS, including all the rules that changed. The other important changes implemented in October 2011, besides new members joining the CRB section, were (a) an increase in the contribution rate for the final salary section, (b) the introduction of a 'cap and share' rule for deficits and surpluses, (c) linking the normal retirement age to the

[2] The resulting changes in cash flows between the members and sponsor are zero sum.

[3] Members who are no longer active contributors, but who have not yet retired.

[4] Back-loading occurs when the scheme uses age-independent contribution and accrual rates (as does USS) and the rate of return on the scheme's assets exceeds the rate of salary growth.

[5] It is not possible to use SDFs to measure changes in risk.

[6] No explicit concerns were expressed for the distributional implications of the rule change.

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