Does the Universities Superannuation Scheme Provide a Model of Reciprocity Between Generations?

Michael Otsuka
London School of Economics and Political Science, GB
m.h.otsuka@lse.ac.uk

This article makes the case that, as an open, ongoing defined benefit (DB) pension scheme, the Universities Superannuation Scheme (USS) once provided a model of reciprocity between generations but no longer does. It begins with an account of the defined contribution (DC) scheme which preceded USS and its investment risk and relatively low pension income that USS was created to rectify. It shows how the funding, investment, and valuation of USS during its first two decades provided a simple and sustainable model of reciprocity, involving the pooling among generations of the investment risk of growth assets. USS’s subsequent shift, however, out of growth assets and into bonds, and the rise in contributions to pay for this shift, have led to an unfair imposition of the cost of securing past pension promises upon current and future generations. This has occurred even though such a shift has been advocated on grounds of intergenerational fairness. A closure of DB and a move back to 100% DC would exacerbate the inequality between generations.

Keywords: Reciprocity; intergenerational fairness; investment risk; risk pooling; pensions; defined benefit; defined contribution; valuation; growth assets; liability matching assets; Universities Superannuation Scheme (USS)

JEL codes: D63, G22, J14, J32

Introduction

Does an open, ongoing defined benefit (DB) occupational pension scheme such as the Universities Superannuation Scheme (USS) provide a model of reciprocity between generations? My answer is that it once provided such a model but no longer does. As it was funded, invested, and valued during the first two decades of its existence, USS provided a simple and sustainable model of reciprocity between generations. These two decades, from the mid-seventies to the mid-nineties, fell within the heyday of DB in the UK. They were prior to the introduction of regulatory changes in the mid-2000s that gave rise to pressure on schemes to ‘de-risk’ their assets out of ‘return-seeking’ equities and into ‘liability-matching’ bonds, to which many attribute the subsequent decline of this form of pension provision.

Over the past 15 years, there has been a tectonic shift from equities to bonds in the investment of the assets of DB schemes across the UK. In 2006, 61% of these assets were invested in equities and only 28% in bonds. By 2020, these proportions had more than completely reversed, with 69% investment in bonds and only 20% in equities. Over the same period, there has been a dramatic fall in the number of open DB schemes in the private sector. In 2006, there were 3.6 million UK workers enrolled in such schemes that were open to their accrual of further pension promises in their years leading up to retirement. By 2020, that figure had dropped to about 1 million. Of those, only about two thirds (669,000) were in pension schemes that were also open to the enrolment of new members [1 pp2, 4, 13]. About 30% of those in such fully open schemes were members of a single scheme – USS – which itself was recently nearly forced to close to both new members and future accrual.

Given the large deficits that USS has reported for its last few valuations – and its recent call for an increase in contributions to 40% or more of salaries – the scheme as it is currently funded, invested, and regulated now represents a failure of reciprocity between generations. USS has appealed to considerations of intergenerational fairness to justify their ongoing, costly shift of the scheme’s investments from ‘growth assets’, such as equities and property, to ‘liability-matching assets’, such as bonds. I argue that these changes do not remedy intergenerational unfairness, but exacerbate it, putting an undue burden on newer and future active members. Further, I argue that the closure of USS’s defined benefit scheme, and its complete replacement with defined contribution (DC) pension pots – as has been proposed in response to the scheme’s funding crisis – would give rise to further inequality between generations.
1. What USS Was Created to Replace
In 2017–18, about 70 UK universities and their colleges tried to move all 200,000 active members of USS over to DC pension pots for future accrual from 2019 and to close the DB scheme to new members as well. This was contested by their employees, who argued that it would amount to an unacceptable transfer of risk from the universities, who were relatively well placed to collectively bear such risks, to the scheme members, who were less well placed to bear these risks as separate individuals [2]. Indeed, the DB scheme under threat had been created about four decades earlier to mitigate these risks that individuals had been exposed to in the DC scheme that USS replaced. It is not very well known that DC pension pots characterised USS’s past as well as its future that university employers tried and failed in 2017–18 to realise. In 1913, a DC scheme called the Federated Superannuation Scheme for Universities (FSSU) had been created, and this operated until the foundation of the current USS DB scheme in 1975. What, then, were the problems with the precursor FSSU DC scheme that USS was set up to solve?

First, the FSSU scheme was criticised for the lack of a predictable relationship between one’s salary at retirement and the pension one could obtain by means of annuity purchase:

Teachers with the same length of service and the same retiring salary [and date] could, and usually did, end up with pensions of different amounts. This could be due ... to an unfortunate choice of the [insurance] company with which the policies were taken out: inevitably some companies managed their funds more successfully than others and there was no sure way of picking in advance those which forty years on would be at the head of the investment table [3 p 10].

Those with the same length of service and retiring salary, and who chose the same insurance company to manage their investments, might receive very different levels of pension income, depending on their date of retirement. This discrepancy was on account of the following two factors: (i) the differences in the returns on investment of the assets in their pension pots during the differing years of their working careers, which was largely due to the vicissitudes of the stock market, and (ii) the different rates at which an insurance company would convert a pound of income in one’s pension pot at date of retirement into annuity income, where the latter was a function of the bond yields prevailing at the moment of conversion.¹

Second, FSSU pensions were criticised for falling short of the public sector inflation-indexed, final salary DB pensions of civil servants and teachers in the following two respects: (i) they provided a lower expected income in retirement, and (ii) the annuities on offer did not protect against the significant erosion of pension payments by inflation.² Two separate reports from the 1960s came to the conclusion that about 80% of FSSU members would require supplementation to bring their pension up to the level of the final salary pension that civil servants received [3 pp 17, 40, 47].

When it was introduced in 1975, USS offered the prospect of a solution to these problems with FSSU, through the provision of a clearly defined benefit of a pension equal to 1/80th of final salary for each year that one was a contributing member of the scheme.³ Universities also agreed to pay in extra contributions to provide final salary pension credit for the years that workers had previously contributed into the old DC scheme.

In moving from a defined contribution to a defined benefit scheme, university employers committed to providing a specific level of pension in retirement, rather than simply to contribute a specified amount into one’s pension pot. Rather than their having to wait and see how much their pension pots grew and what the annuity rate was at date of retirement, USS promised to pay each member an income from retirement to death that bore a predictable relation to one’s final salary, with full protection against erosion by inflation. Consequently, in exchange for an initial modest increase in contributions, USS offered what was widely regarded as a superior pension to what one could realistically expect under FSSU. Members were given the option of remaining in FSSU, but they almost universally transferred into USS [3 p 91].

2. Reciprocity Between Generations for Mutual Gain
Those who are invested in DC pension pots are typically advised to engage in ‘life-cycle’ de-risking of their portfolio by shifting from growth assets such as equities to less volatile assets such as bonds as they near retirement. One rationale for such a shift is to protect against a great fall in the value of one’s assets, from which it will be difficult to recover, close to the point at which one will need to transform these assets into retirement income. A second rationale is that greater investment in bonds provides an effective hedge against an increase in the price of the purchase of an annuity at retirement, since that price is determined by the price of bonds in which annuity providers invest. Historically, however, such an investment strategy would have been a costly and ineffective form of protection against risk for both British

¹ To provide an illustration from the United States: if a worker in that country had retired and purchased an annuity in December 2008 rather than December 2007, a brutal combination of a drop in the stock market and a fall in bond yields would have cut his retirement income nearly in half if his DC pension pot had been invested entirely in equities throughout his working career [4 p 336].
² See Logan [3 p 22]. Before the seventies, however, public sector pensions also lacked protections against erosion by inflation [3 pp 40–41].
³ In addition, members were entitled to a lump sum on retirement, equal to three times their pension. At the time, this lump sum in combination with 1/80th accrual was deemed actuarially equivalent to a civil servant’s 1/60 final salary promise without any lump sum in addition [5 p 133]. As was the case with public sector pensions at the time of USS’s foundation, pensions in payment were revalued each year by increases in inflation.
and American workers. According to one study, in the vast majority of years from 1948 to 2007, this sort of de-risking would have made workers in the UK and the US poorer in retirement than if they had maintained a high wire strategy of remaining invested purely in equities throughout their career [6 p106].

By joining together as a collective, the creation of USS made it possible for members to pool risks across different generations in a manner that avoided the costs of life-cycle de-risking. Investment risk was tamed by each year’s cohort in the scheme entering into implicit covenants with other cohorts, binding them together as a multigenerational corporate body – “an ongoing entity with a long-time horizon” [7 p23]. The contributions of workers and pensioners were pooled into a single fund whose portfolio was constantly heavily weighted towards growth assets during the working lives and retirements of each individual, thereby providing each member of this collective with a better pension than she was previously able to generate through her own personal DC pension pot. Those whose invested contributions exceeded the expected growth rate implicitly agreed to transfer this surplus to the cohorts whose investments fell short, in a manner which smoothed over investment risks, making it possible for the fund to safely remain continually invested in higher risk, higher return growth assets such as equities and property. In words that modify Burke’s famous description of society as a contract: an open, ongoing, enduring collective pension scheme can be conceived of as a partnership not only between those who are working, but between those who are working, those who are retired, and those who are to be born and to take up work in the years to come.

Such smoothing of investment risk over time was fairer to different cohorts than DC pension pots, since the level of income members ended up receiving in retirement was no longer so heavily dependent on fluctuations in the stock and bond markets. Members’ joining such an enduring collective entity at the beginning of their working lives could also be justified as a mutually advantageous pooling of both investment and longevity risks, involving reciprocity between different cohorts. At this point of early adulthood, one’s choice to join the scheme is made in extensive ignorance of one’s own prospects for a long life and for a retirement when the stock market is bullish rather than bearish. In large part because people’s known longevity and investment risks are both significant and roughly equal at an early point of entry into the scheme, most will have compelling reasons of self-interest to damp down these risks, in this case through their collective pooling into the DB scheme rather than going it alone with a DC pension pot.

This, in a nutshell, is the theory behind collective defined benefit pensions. How, in the case of USS, has theory worked in practice?

### 3. USS’s Valuation and Funding During Its First Two Decades

Since, under FSSU’s DC scheme, no specific level of pension was promised in retirement, there was no need to enlist the services of an actuary to try to calculate what level of contributions would be sufficient to cover the cost of the promised pensions. By contrast, the administrators of the USS DB scheme required the services of an actuary to determine (i) whether the pensions that had been promised during the previous years of workers’ careers were adequately funded and (ii) the level of the annual pensions contributions required in their future years leading up to retirement to fully fund the promised additional income they would receive as pensions in exchange for these contributions.

To do so, the actuary needed to predict by how much workers’ salaries would grow each year, how long they would live in retirement, what the future rate of inflation would be, and the expected returns on investments in the pension fund. The salary growth assumption was needed to predict how high the final salaries of members would be, with the value of their pensions calibrated as 1/80 of their final salary for every year of their membership in the scheme. The inflation assumption was needed because pensions in payment were promised to increase by the retail price index (RPI) each year. Consequently, the actuary needed to provide an estimate of the returns on the financial assets purchased from contributions into the scheme in order to determine whether these returns would be sufficient to cover the estimated cost of paying pensions as they fell due.

In the early to mid-1990s, returns on USS’s investments were assumed to be 8.5% per year for the coming decades. It was also assumed that salaries would grow up to 6.5% per annum and that RPI inflation would be 5% per annum. On the basis of these assumptions, the scheme’s actuary calculated that contributions of roughly 20% of salary would be sufficient to fully fund the final salary promise. Though they may now strike many as overly optimistic, these assumptions were in line with, if not slightly more conservative than, actuarial assumptions and practices that prevailed in the UK from USS’s foundation in the mid-seventies through to the mid-nineties, with actuaries typically assuming long-term investment returns of 9%, salary inflation of 7%, and an RPI price inflation of 5% throughout this period.8

---

8 “In a pooled-asset plan, while the individual worker ages one year per year, the collective group of workers does not age as rapidly as any individual, so that the portfolio can remain invested longer in higher return assets such as equities, infrastructure and private equity.” [7 p17].

5 In this section, I have merely gestured at some ways in which an ongoing, collective pension scheme tames the investment and longevity risks associated with individual DC pension pots. I offer a fuller explanation in [8], Chs 1 and 2.

6 Records of the assumption for USS’s valuations prior to 1990 have not been made publicly available.

7 Here is how the scheme’s actuary characterised the assumptions that investment returns would exceed inflation by 3.5% and salary growth by 2%: “The experience of the 1980’s might suggest that these assumptions are pessimistic whilst the experience of the 1970’s might suggest that any assumption of a positive investment return is optimistic...it must be appreciated that these assumptions are long term average rates of return - on average the ‘good’ years are expected to be better than the ‘bad’ years to the extent shown in the assumptions.” [9 p11].

8 See the tweets of various UK actuaries in reply to this tweet for a record of actuarial practices from the mid-seventies to the mid-nineties: https://twitter.com/MikeOtsuka/status/1216979654827040773.
How sound were USS’s assumptions in the mid-nineties regarding the returns on the assets in the scheme? To answer this question, we can draw on nearly a quarter of a century of actual returns on various types of asset since 1996, which reveal that the portfolio in which USS was invested in 1996 would have grown by roughly 7% per annum between 1996 and 31 July 2020 if such investment had been maintained throughout that period. Such a return is about 1.5% below the assumed investment return of 8.5%. It is, however, the real returns over RPI that are more relevant, and which show a more favourable outcome. RPI inflation throughout this period was about 2% below the assumed rate (3%, rather than 5%), meaning that annualised real returns were approximately 4%, exceeding the assumption of 3.5%.

However, in order to establish that USS’s final salary pension promises laid down up to the mid-nineties were well funded, it is not enough for the scheme’s assets to have met expectations for the 25 years from the mid-nineties to the present. They must also meet these assumptions for the next 50 years, fulfilling their promises to active members to provide up to 80 years in the future.

According to USS’s recent best estimates of expected returns on different types of assets which are held in the year 2020, the mixture of assets in which the scheme was invested in the mid-nineties is expected to grow by slightly less than 3% per annum above RPI from 2020 to 2050. In terms of real returns on equities, property, and bonds, these estimates are therefore not significantly less optimistic than they were in the mid-nineties, estimates made prior to the dotcom bubble in the early 2000s, the global financial crisis of 2007–08, and the coronavirus pandemic. They do not fall very far short of the assumption of 3.5% real returns over RPI on the basis of which contributions of 20% of salary for a 1/80th final salary DB pension were set in the mid-nineties.

4. Is USS’s Recent Departure From the Above Model Justified On Grounds of Intergenerational Fairness?

In a stark contrast to their 1996 valuation, USS’s 2020 valuation instead assumes that the assets in which the scheme is currently invested and plans to invest during the next several decades will shrink by 0.2% against RPI each year, for the next 30 years. On account of this highly pessimistic assumption regarding returns, USS is now calling for contributions double the size of the contributions they required in the nineties. It is primarily for the following two reasons that USS’s assumed returns on their investments are now much lower than they were in the nineties:

First, the portfolio out of which USS will fund its existing DB promises is much more heavily weighted towards bonds than its historical nineties portfolio. Like many DB portfolios back then, USS’s was about 80% invested in equities, with the remaining 20% split between property and government bonds. After the global financial crisis of 2007–9, USS embarked upon a rebalancing of its portfolio away from equities and towards bonds. On the assumptions of the current valuation, the portfolio will average out to roughly one-third in equities and property and the remainder in bonds over the next several decades. This decision to shift the portfolio into bonds has significantly reduced expected returns, from the aforementioned 3% returns above RPI to about 1.25% above RPI.

The returns I have just quoted are those one can expect on average, per annum, over the long term. Back in the nineties, contributions were set on the basis of such expected returns on the assets. Regulations, however, now require expected returns to be “chosen prudently”, with USS proposing contributions in its most recent valuation on the basis of returns that one can expect to achieve about 75% of the time rather than merely on average. This is the second reason why USS is now assuming such low returns. The upshot of such extreme prudence is to reduce the assumed returns from 1.25% above RPI to about 0.20% below RPI.

In rejecting a “higher-return (and higher-risk) investment strategy” involving continual investment in a portfolio weighted towards growth assets, USS has voiced concern over intergenerational fairness, suggesting that “in effect more risk is being taken to meet pensioner liabilities and, if that risk materialises, the cost increase would be split between employers and active members...” [13 p38]. Similarly, USS’s CEO Bill Galvin has previously written that:

Pensions promised now depend on the next generation being willing to pay more in future if necessary to make good on past promises. For the intergenerational contract to work, the current generation must do its best to ensure that the risk of placing too high a burden on future generations is not too big [14].

The sort of scenario USS has in mind is one in which investments fall very short of the assumed returns on a portfolio heavily weighted towards growth assets, resulting in extra contributions being needed to recover the deficit on past pensions liabilities. Given the regulator’s call for schemes such as USS to fill their deficits quickly, this will especially disadvantage current working members, as this diminishes the amount that employers can contribute towards the future service of their pensions.

---

9 See Galvin, [10], slide 8, for USS's modelling of returns from July 2009 to July 2019 on the historical portfolio in which USS was invested in 2009, which was similar to the portfolio in which USS was invested in previous years, going back to at least 1996. By my calculations, assets invested along the lines of this portfolio would have fallen in value by about 4.2% between 31 July 2019 and 31 July 2020, and the annualised rate of return from 1996 to 31 July 2020 would have been about 7%.

10 I have inferred this from USS’s ‘Consultation for the 2020 valuation’ [11].

11 UK Parliament [12], regulation 5(4)(a).
However, this objection to growth-asset-weighted investments is not without its own challenges. USS’s current approach to investment is at least as vulnerable to an objection of intergenerational unfairness. In shifting away from growth assets and prioritising bonds, one greatly reduces the risk of a large deficit, given bonds’ liability-matching character. But such protection against downside risk is costly. As a result, contributions must rise significantly beyond the level that previous generations of employers and members paid. The certainty, under USS’s preferred approach, of being saddled with higher contributions now to fund the pensions promises made to previous generations is no fairer to the current generation than the possibility of even higher contributions arising from a large deficit.

Up until about a decade ago, the level of pensions contributions was assessed on the assumption that they would be invested predominantly in growth assets. Contributions were historically low on account of such an investment strategy. But USS’s ‘de-risking’ of the portfolio involves an expensive post hoc change to the investments on which contributions for past pensions promises were premised. Therefore, anyone who was an active member ten or more years ago received pensions promises backed, at relatively low cost to them and their employers, by a growth portfolio. But current and future active members and their employers are now being made to pay the high cost of the portfolio’s shift to bonds to underwrite past promises. This is especially unfair to those who joined USS since this shift and to those who will become members.

5. The Intergenerational Unfairness of Returning to Individual DC Pension Pots Today

Many fear that USS’s reallocation of the portfolio to bonds will render the future accrual of DB pension promises so expensive that employers will call for a return to individual DC pension pots, as was the case before the foundation of USS in 1975. This would give rise to an acute degree of intergenerational unfairness.

Although the annuities one could obtain from the DC scheme that pre-dated USS were less good and less reliable than final salary civil service pensions, annuity rates were far more favourable in the 1960s and 1970s than they now are, since government bond yields were much higher throughout that period. Given how low such yields have been in recent years, the conversion of one’s pension pot into an annuity is no longer considered a sensible retirement option, and the market for annuities has collapsed. In arguing for the move from DB to DC in 2017–18, university employers did not try to make the case that scheme members would be able to convert their pension pot into a decent annuity. Instead, they made the case that the income one could expect from a drawing down of one’s pension pot in retirement would not fall far short of the defined benefit pension that employers sought to abandon. In so doing, they ignored the fact that the decrease in expected income from drawdown was accompanied by the significant increases in both longevity and investment risk.12

The fact that annuities are no longer an affordable retirement option for those with individual DC pension pots renders today a much worse time to return to such DC arrangements than the point at which they were abandoned in the mid-seventies in favour of the USS defined benefit scheme. Any shift from DB to DC should be resisted until it has been confirmed that it will be possible to replace income drawdown with a more reliable DC source of pension income in retirement, such as collective defined contribution (CDC), which is now being introduced in the UK and which greatly mitigates the investment and longevity risks of drawdown. Now would be the wrong time to switch back to DC, in the current absence of something approaching a guaranteed DB pension which is not nearly as expensive as an annuity.13

Competing Interests

The author is an active member of the Universities Superannuation Scheme (USS) and an alternate member, appointed by the University and College Union (UCU), of USS’s Joint Negotiating Committee.

References

1. Pension Protection Fund. The Purple Book 2020: DB Pensions Universe Risk Profile; 2020.
2. Otsuka M. The incoherence of UUK’s attitude towards risk: Low risk is intolerable when shared by 350 institutions but high risk is fine when borne by workers individually [Internet]; 2 January 2018. Available from: mikeotsuka.medium.com/the-incoherence-of-ukus-attitude-towards-risk-f377f514f8b85
3. Logan D. The Birth of a Pension Scheme: A History of the Universities Superannuation Scheme. Liverpool: University of Liverpool Press; 1985.
4. Burtless G. Lessons of the Financial Crisis for the Design of National Pension Systems. CESifo Economic Studies. 2010; 56(3): 323–349. DOI: https://doi.org/10.1093/cesifo/ifq001
5. Blake D. Pension Schemes and Pension Funds in the United Kingdom. 2nd ed. New York: Oxford University Press; 2003.
6. Cannon E, Tonks I. The Value and Risk of Defined Contribution Pension Schemes: International Evidence. Journal of Risk and Insurance. 2013; 80(1): 95–119. DOI: https://doi.org/10.1111/j.1539-6975.2011.01456.x

12 See [15].
13 Although legislation has recently been enacted and regulations drafted in the UK to make CDC possible for single-employer schemes, it is not yet available for multi-employer schemes such as USS. I present a case for CDC in chapter 2 of [8].
7. Brown R, McInnes C. Shifting Public Sector DB Plans to DC: The experience so far and implications for Canada. Canadian Public Pension Leadership Council; 2014.

8. Otsuka M. How to Pool Risks Across Generations: The Case for Collective Pensions. Oxford University Press; forthcoming.

9. Universities Superannuation Scheme (USS). Report by the Actuary on the Actuarial Valuation as at 31 March 1996; 1997.

10. Galvin B. USS Update. The Universities UK Conference 2019 [Internet]; 11 September 2019. Available from: academicfreedom.watch/sites/default/files/2019-10/Bill Galvin presentation to UUK 11 September 2019-S.pdf

11. Universities Superannuation Scheme (USS). A consultation for the 2020 valuation: A consultation with Universities UK on the proposed methodology and assumptions for the Scheme's Technical Provisions [Internet]; 28 August 2020. Available from: www.uss.co.uk/-/media/project/ussmainsite/files/about-us/valuations_yearly/2020-valuation/uss-technical-provisions-consultation-2020-valuation.pdf

12. UK Parliament. The Occupational Pension Schemes (Scheme Funding) Regulations 2005 [Internet]; 30 December 2005. Available from: https://www.legislation.gov.uk/uksi/2005/3377/contents

13. Universities Superannuation Scheme (USS). Methodology and risk appetite for the 2020 valuation: Technical discussion document for USS sponsoring employers [Internet]; 9 March 2020. Available from: www.uss.co.uk/-/media/project/ussmainsite/files/about-us/valuations_yearly/2020-valuation/2020-valuation-discussion-document-final.pdf

14. Galvin B. How decisions are made on future pensions for USS [Internet]; 17 August 2017. Available from: https://www.uss.co.uk/news-and-views/views-from-uss/2020/06/08242017_how-decisions-are-made-on-future-pensions-for-uss

15. Otsuka M. UUK can’t transform a sow’s ear into a silk purse: unspinning Aon’s modelling of our employers’ proposal [Internet]; 13 December 2017 Available from: mikeotsuka.medium.com/uuk-cant-transform-a-sows-ear-into-a-silk-purse-8c764ce57e83