

Reckless Prudence How to break a pension system



George Cooper, Chief Investment Officer

Were British university staff right to strike over changes to their pensions system?

We were asked this question a few weeks ago, by one of our clients.

Our short answer was: Yes, it looks like the academics were probably right to strike.

The following explains our answer and is relevant to all pension schemes.

Things don't always add up

Fallacies of composition, situations where one rule holds for part of a system but its opposite holds for the whole system, cause endless confusion in finance and economics.

Keynes's 'paradox of thrift' is the most famous of these fallacies of composition. Individuals can reduce their expenditure, to increase their savings, but the economy as a whole cannot do the same. If a majority of individuals start saving the economy contracts and incomes fall, undermining the effort to save; a self-reinforcing contraction ensues. The mirror 'paradox of gluttony', works in the opposite direction. If a majority of individuals start borrowing to spend, incomes rise to fund the borrowing, and a self-reinforcing expansion follows.

A similar, though less obvious, fallacy of composition occurs in the pension system.

For good reason, governments cajole and coerce their populations to save more for their retirement. This is sensible for the individual but, at the aggregate level, the economy cannot save for retirement and does not need to.

It is worth taking the time to understand this fallacy of composition, it helps explain how pension assets should be invested and why recent attempts to 'de-risk' pension schemes are causing systemic risks in the pension system as a whole.

Alone on a desert island

Consider the pension predicament of Robinson Crusoe¹, alone on his desert island. Living, as he does, on his daily catch of fresh fish he will be getting enough regular exercise and Omega-3

fatty acids to ensure a long and healthy life. He can therefore expect to live well past the statutory retirement age.

An individual can save for retirement, a society cannot.

Unfortunately for Mr Crusoe, his retirement options are bleak. No matter how good a fisherman he was in his youth, he had no way to store any excess catch for retirement. The fish would rot, long before he needed them. Being alone means he must work until he drops.

On the other hand, had Mr Crusoe been stranded with Girl Friday then, with a bit of luck, the pair of them would have been able to breed themselves a pension. Namely, children, to look after them in their dotage.

To obtain a pension, Mr & Mrs Crusoe would need to: produce the next generation; teach them to catch fish; and persuade them to share their future catches. If the Crusoe's fail in any of these three areas, they will get no pension.

What is true for the Crusoe's pension system is true for all pension systems. Today's pensioners do not consume a surplus produced in their youth. They consume the goods and services being currently produced by today's workers. If today's workers fail to produce, there will be no pensions. The point being, pension systems do not store goods and services for future use, rather they are devices by which the current output of the economy is split between workers and retirees.

Splitting the income

In traditional societies families provided 'pensions' through an implicit social contract; children looked after their parents, in the expectation their children will do the same for them. As societies industrialised, and people organised themselves into smaller nuclear families, it became necessary to formalise an institutionalised version of this somewhat hit-and-miss arrangement.

Broadly speaking, pensions systems have been institutionalised in two different ways: unfunded or 'pay-as-you-go' schemes and funded schemes. At first sight funded and unfunded pensions appear quite different but, at the aggregate level, they are very similar.

It is easiest to think about unfunded, pay-as-you-go, pensions as working through the tax system. The income of today's workers is taxed, and that tax is used to pay the pensions of

¹ [Reforming Pensions: Myths, Truths, and Policy Choices. Nicholas Barr, IMF Working Paper August 2000.](#)

today's retirees. There are no assets in a pay-as-you-go pension system, which is why they are called unfunded schemes, just a simple division of income between workers and pensioners.

In funded pension schemes workers are still required to sacrifice part of their income. The sacrificed income is then used to purchase financial assets. In equilibrium, those assets are, in effect, bought from the retirees who had themselves accumulated them while working. Therefore, as in an unfunded scheme, current income is passed from worker to retiree. The only difference being that capital markets are used as an intermediary step, to facilitate the transfer of income.

In equilibrium, neither the funded nor unfunded scheme draws on savings. An individual can save for retirement, a society cannot.

There are advantages and disadvantages to both funded and unfunded systems:

Payments into unfunded pensions feel like paying tax. Payments into funded pensions feel like savings. As saving is more palatable than paying tax it is easier to persuade people to participate in funded schemes.

Unfunded schemes do not automatically link the amount contributed to the subsequent pensions provided but funded schemes directly link contributions to pensions, albeit with associated investment risk inserted between the contributions and withdrawals. Unfunded schemes may have a redistributive element whereas funded schemes generally do not. As a result, the political left generally favours unfunded pensions while the right favours the aligned incentives of funded schemes.

Unfunded schemes do not suffer from financial market risk or inflationary risk. If inflation pushes up wages it will also push up tax and therefore pensions. Wages, pensions, and with lags, the cost of living all rise in tandem. By contrast funded schemes are exposed to considerable financial market and inflation risk. If the assets fall in value, relative to wages, pensioners will be unable to realise an adequate pension. If pension assets rise in price, relative to wages, pensioners will enjoy a windfall gain, at the expense of current workers, who will have to sacrifice more of their income to purchase the assets. In this way, financial market volatility may cause significant intergenerational wealth transfer.

the assets of a funded pension scheme could be replaced with seashells

Similarly, average investment returns influence the cost of funded schemes. If, on average, pension assets tend to fall in value, relative to wages, members will be able to withdraw less spending power than originally contributed, making the schemes expensive to fund. But, if investment assets tend to rise in value relative to wages, members will be able to withdraw more spending power than originally contributed, making the scheme cheaper to fund.

Funded schemes generate large pools of assets, unfunded schemes do not. Since large pools of assets generate large investment management and consulting fees the financial services industry favours funded pensions.

It is worth pointing out that both funded and unfunded schemes are subject to the same demographic challenges. If the ratio of workers to retirees declines, there will be less wages either to tax or to buy pension assets. In both cases either pensions will have to fall, relative to wages, or pension contributions will have to rise. The reverse holds if ratio of workers to retirees rises.

There is no way to get around the demographic challenge of an aging population by tinkering with the pension system. As we live longer, some combination of later retirement ages, higher pension contributions, and lower pension benefits, must occur.

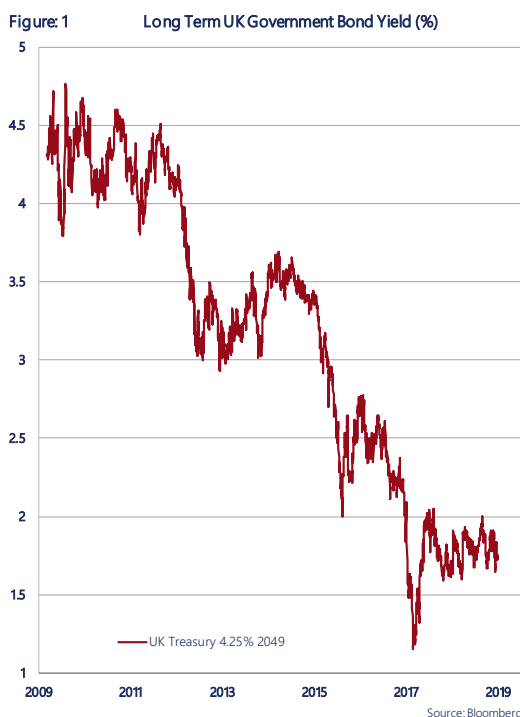
Seashells will almost do

As explained, both funded and unfunded pensions are just devices to divide current income between workers and pensioners. In equilibrium, the pool of assets in a funded pension system remains essentially static, although the ownership of those assets continually rotates from pensioners to workers.

For as long as workers' contributions keep coming, and broadly match the pensioners' withdrawals, a funded scheme can operate much like an unfunded scheme. The pool of assets

remains in situ, used primarily as a unit of account to link prior contributions to current withdrawals. In theory, the assets of a funded pension scheme could be replaced with seashells, or any other token, and the system could still operate.

However, replacing the assets with seashells would work only if everyone agreed that the seashells would maintain their value, with respect to wages, from one generation to the next. If their values change substantially there will be significant, and unfair, wealth transfers between generations. Extreme valuation fluctuations would cause the pension system to fail.



This little thought experiment helps explain why it is essential for pension assets to hold their value, with respect to wages, across generations. This is the most important requirement of pension assets.

Keep them real

If it is possible to invest pension contributions in a pool of assets whose values keep pace with wages and at the same time produces additional income, all generations of contributors will be able to withdraw more spending power from the pension system than originally contributed. This would help reduce the overall funding cost of pensions. On the other hand, if the assets steadily lose value with respect to wages, pensioners would be unable to withdraw as much spending power as originally contributed, making pensions more expensive to fund.

Our capital markets are broadly divided into three asset classes: bonds, equities and real estate.

The income from bonds is fixed in monetary terms and bonds generally have the right to be paid first. As a result, bonds offer investors only modest returns which, on average, fail to keep pace with wage growth.

Equities by contrast generate returns only after bond holders, creditors, and usually employees have been paid. As a result, their returns are more volatile and their values less stable. As a result, equities tend to offer higher returns which, on average, outstrip wage growth.

Like equities, real estate values are susceptible to the vagaries of economic cycles. Liquidity is poor, but the backing of physical assets is reassuring. As result, the returns on real estate tend to sit somewhere between equities and bonds, generally a little closer to equities.

This tiering of risk and returns means, over the long run, a portfolio of equities and real estate tends to outperform wage growth, while a portfolio of bonds tends to underperform wage growth. This makes it cheaper to fund a pension scheme if the investments are held predominantly in equities and real estate, rather than bonds.

Surprisingly, despite their higher short-term volatility, it is also far safer for a pension scheme to invest in equities and real estate rather than bonds. This is because of the exceptionally long, effectively infinite, investment time horizon of pension schemes, and the requirement for their investments to hold value with respect to wages.

In the long-run, company revenues, company profits and rents are tied to the growth of the economy, this in turn ties the value of equities and real estate, albeit loosely, to economic activity, wages and the cost of living. This is why equities and real estate are called 'real assets'; they hold their value relative to the real prices in the economy, making them a natural hedge against inflation.

By contrast bonds, especially long-term bonds, are a much riskier asset for pension investors. In periods of high inflation, the revenues derived from bonds, being fixed in nominal terms, can suffer dramatic declines in value with respect to wages and the cost of living. Over the very long, multi-generational, time horizon of pension funds, the erosion of value caused by inflation becomes the dominant investment risk. For this reason, bonds, especially long-term bonds, are inappropriate investments for pension funds, in our view.

It is worth putting some figures on the differences in returns between bonds and equities and the potential effects of inflation.

UK equities are currently priced to deliver a real, after inflation, return of about 7% per year. Long term UK government bonds are priced to lose 1.6% in real terms each year. These figures suggest, over a holding period of 30 years, a portfolio of UK equities will have around 12 times more spending power than the equivalent portfolio of UK government bonds.

There are reasons to be cautious over the 7% real return figure for UK equities; we believe better returns are available elsewhere. But we can be very confident long-term UK government bonds will lose at least 1.6% on average over the next thirty years. If you're so inclined you can guarantee that long term loss today, by buying long term index linked gilts with negative yields – many pension funds are doing just that. If

future inflation turns out to be higher than currently expected the real losses from long term nominal bonds will be even greater.

A worker who sacrifices £100 of today's spending power into his or her pension may expect to withdraw the equivalent of £760 of spending power in 30 years' time, if they invest in equities. If they invest in very long-term UK government bonds they should expect only around £60 of spending power. If over those 30 years inflation turns out to be about 2% higher than currently expected the bond investor will get back only around £30 of spending power.

Therefore, investing a pension in long term bonds rather than equities is not just dramatically more expensive it is also considerably riskier. Nevertheless, in recent years, it has been the fashion for pension funds to switch out of equities into bonds. And those switches have been presented as reducing rather than increasing investment risk. It is worth understanding why this has happened.

When risk reduction means more risk

Pension funds are abandoning equities in favour of bonds due to an obsession with minimising the mark-to-market volatility of pension liabilities relative to pension assets. The desire to minimise this risk has led to an almost total disregard for investment returns.

the goal of Quantitative Easing is to make long term bonds bad investments

Funded pension schemes come in two flavours: Defined Benefit (DB) schemes and Defined Contribution (DC) schemes. The key difference between the two being who 'owns' the investment risk.

In a Defined Benefit scheme the pension sponsor guarantees a pension, in nominal terms, albeit with some prescribed, but limited, inflation related uplift. If the pension scheme's investments perform poorly, the sponsor is obliged to make up the difference, sometimes with ruinous consequences.

In Defined Contribution schemes, the realised pensions are simply the product of the initial contributions and the subsequent investment returns. The pensioners bear the consequences of the investment returns.

It is the changes in investment strategy of the DB rather than DC schemes that is of interest here.

Understandably, the DB scheme sponsors are keen to know the extent of their market risk, as are their regulators.

The framework that has developed to measure these risks is simple enough, at least in principle. Actuaries estimate the longevity of the pension scheme members and use those calculations to estimate the likely future pension payments. The future liabilities are then discounted back to arrive at a net-present-value. The interest rates at which the future liabilities are discounted are derived from current bond yields.

The net-present-values are then compared with the current value of the schemes' investment portfolios to arrive at a funding surplus or deficit figure.

For larger mature schemes with many members and substantial investment portfolios the market risk of the pension scheme often swamps the balance sheet of the sponsoring entity.

As a result, DB scheme sponsors are faced with two problematic risks. If the investment portfolio falls in value or if bond yields decline, pushing up the calculated present value of future liabilities, the sponsor can be obliged to inject substantial new funds into the scheme. This destabilises the sponsor, impairs

their ability to invest and to grow their businesses and, in extremis, may even put them out of business.

A talentless servant

Asset-liability-matching is an ancient investment strategy:

"a Lord planning to travel to a faraway country summoned his servants. To one he gave five talents, to another two, and to the third one talent; to every man according to his ability..."

...The servant that received the five talents went and traded with them and made another five. And likewise, he that received two also gained another two. But he who received one went and dug in the earth and hid his master's money..."

After a long time, the Lord of the servants returned. He that received five talents brought another five talents, saying, Lord though gave me five talents: behold, I have gained five talents more...His Lord said to him, Well done...I will make you ruler of many things.

He who received two talents came and said, Lord, you gave me two talents: behold, I have gained two more besides... His Lord said to him, Well done, good and faithful servant...I will make you ruler of many things...

Then he which had received the one talent came and said, Lord, I knew you were a hard man, reaping where you had not sown and gathering where you had not strawed: And I was afraid, and went and hid your talent in the earth: lo, thou hast that is thine...

His Lord answered; thou wicked and slothful servant...though ought to have put my money to the exchangers, and then at my coming I should have received mine own usury...he took the talent from him and gave it to the servant who had ten talents.

For unto everyone that hath, shall be given, and he shall have abundance: but from him that hath not, shall be taken away even that which he hath. And cast ye the unprofitable servant into outer darkness: there shall be weeping and gnashing of teeth."

Hopefully, at least some of our readers will recognise that as a slightly abridged version of 'The Parable of the Talents', Mathew 25.14

In modern language the third servant used an asset-liability-matching strategy, minimising risk while disregarding returns. His reckless prudence guaranteed both his liability and his investment failure.

In response, many scheme sponsors have chosen to 'de-risk' their investment portfolios using asset liability matching (ALM) strategies.

These 'de-risking' strategies involve reducing exposure to the more volatile equity assets and replacing them with very long dated bonds whose cash inflows closely match the expected pension fund's cash outflows. This matching of bond-assets with pension liabilities means the scheme's calculated funding level is no longer sensitive to interest rate movements; falling yields boost both assets and liabilities by equal and therefore offsetting amounts.

From the perspective of the individual scheme sponsors, the matching of assets and liabilities reduces business risk. But for the pension system as a whole it almost certainly increases risk.

As discussed, switching from higher returning equities into lower returning bonds pushes up the funding requirement of the scheme, often requiring the sponsor to inject additional capital. Often this is diverted away from business investment thereby undermine growth. As explained earlier, all pension systems ultimately rely on the production of future generations, therefore, anything that undermines economic growth also undermines the viability of the pension system.

More worryingly, the increased allocations to very long-term bonds introduces systemic inflation risk into the pension system.

Quantitative Easing

At present, long-term bond yields are extremely low. On the face of it this implies the markets are expecting future inflation to also be very low. However, one of the main reasons for these low yields is central banks' Quantitative Easing policies.

Quantitative Easing is a process by which central banks purchase bonds at elevated prices to push down their yields. The aim being to generate inflation by boosting borrowing and spending. It follows, in periods of Quantitative Easing, bond

yields cannot be expected to accurately anticipate future inflation. Put differently, the goal of Quantitative Easing is to make long term bonds bad investments.

If the central banks are successful in their attempts to increase future inflation – and we believe they will eventually succeed – a substantial part of the real value of long-dated bonds will be wiped out. The DB schemes invested in these bonds will be able to deliver the nominal pensions they have budgeted for, but those pensions may fail to provide enough spending power to live on.

Finally, and perhaps most controversially, the very act of closing a pension scheme to new members may create a funding crisis where none existed. Again, as discussed earlier, in equilibrium, funded schemes can operate almost like unfunded schemes with current contributions paying current pensions. In this situation the returns on the assets may serve only a minor role of either topping-up the pensions or reducing the contributions.

It is a contentious question as to whether funded pension schemes should factor in future contributions into their solvency calculations. If the scheme is operating in a shrinking or dying industry the flow of future contributions will dry up, forcing the scheme to rely on its assets. But if the industry remains vibrant and expanding the inflows could continue indefinitely and the scheme may never need to sell its assets. It is difficult to see how to deal with this issue without resorting to a common-sense case-by-case assessment of individual schemes.

While acknowledging this difficulty, as explained, it is impossible for a pension system in aggregate to function without the contributions of the next generation of workers. It therefore seems unreasonable not to consider future pension contributions in current solvency assessments. Doing so risks putting an unreasonable, unnecessary and probably impossible burden on current contributions.

University Pensions

This brings us back to the question we started with: Were university staff right to strike over their pensions?

By way of background, in February this year many British university staff staged a series of strikes over proposed changes to their pension scheme. As we understand it, at its last periodic solvency test, the University Superannuation Scheme concluded that it had a substantial funding shortfall. The proposed remedy for this shortfall was a wholesale reorganisation of the scheme involving: increased contributions, reduced benefits, moving to a defined contribution model, and 'de-risking' the investment strategy by switching from equities into bonds.

Given that most asset classes have performed well over recent years, we assume the deficit within the USS scheme emerged not from poor investment returns but rather from an upward revaluation of the liabilities caused by the significant decline in long term bond yields (Figure 1). If so, this deficit may be little

more than an accounting mirage, a temporary artefact of the artificially low yields caused by Quantitative Easing.

As discussed, all pension systems rely on the productivity of the next generation; if we are not producing and training the next generation there will be no pensions of any sort. Education is a prerequisite for all pension systems, regardless of their structure or funding levels. For this reason, education is an industry likely to survive into perpetuity.

it is conceivable the University Superannuation Scheme may never need to draw on its assets

If we accept universities are a perpetual industry, then future pension contributions from university staff should be considered a perpetual income stream. This means it is safe to rely on those payments to meet future pension payments.

Of all industries, university education may be the most suited to organising its pension system on an entirely unfunded pay-as-you-go model, without any assets at all. Serving, as it does, an expanding perpetual industry, it is conceivable the University Superannuation Scheme may never need to draw on its assets.

In our view, it is probably unwise to trigger a wholesale re-engineering of the scheme, based on a solvency test that is itself likely distorted by temporarily depressed bond yields due to Quantitative Easing.

Guaranteed failure

Hopefully the above has explained why we at Equitile believe the pension industry is making a fundamental mistake in shifting its assets from equities into bonds. That said, we understand why solvency tests and the increased focus on risk management is causing this to happen.

As we see it, much of the problem lies in the rigid guarantees built into Defined Benefit Schemes. In financial markets guaranteeing investment returns is an extremely expensive business, so expensive the cost of the guarantees tends to wipe out all the investment returns. This is what is happening with Defined Benefit pension schemes, and it is making them uneconomic to operate.

We believe all parties, including the pensioners themselves, would be better off if Defined Benefit schemes were recast as Expected Benefit schemes.

By relaxing the guarantees pension schemes would be able to invest in more appropriate higher returning equities. This would allow schemes to remain open so that more people would benefit from them. It would reduce the average funding cost of pensions and would leave sponsors in a better position to invest in their own industries, for the benefit of all generations. Crucially, it would also allow pension schemes to better protect their members from future inflation and, we expect, would allow higher pension pay-outs. ■

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