Pensions regulation based on mark-to-market valuation lacks transparency and overstates risk

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Although it is the largest in terms of assets and number of members, the University Superannuation Scheme (USS) is only the latest in a long line of private sector defined benefit pension schemes to be threatened with closure under the current system of regulation. USS members, of whom there are over 200,000 actively contributing, have seen through this and taken industrial action to challenge the valuation. They, being mainly academics, and, as such, disinclined to accept anything on trust, and to think things through from first principles for themselves, have questioned the methodology that would lead to this apparently well funded scheme being suddenly closed to DB accrual. The result of the industrial action has been the setting up of a high level enquiry under a panel of experts appointed jointly by the employers’ body, the UUK, and the members’ union, the UCU.

The Joint Expert Panel published its first report on 13 September 2018 commenting on the USS valuation dated at March 2017, which is the focus of the dispute and has not yet been completed. It is quite critical of some of the actions of the employers, the scheme management and also the regulator. The panel is due to continue its work into a second stage to look more fundamentally at the regulatory methodology, particularly as it applies to the university sector.

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1 A revised version of a presentation given at the CSFI Roundtable “Pension funding – more than an academic question” 27 September 2018, Wax Chandlers Hall, London.
2 The scheme also has approximately 70,000 retired, and 150,000 deferred members.
3 It is important to understand that the USS is the pension scheme covering only the so-called pre-92 universities and associated institutions, including Oxbridge, the Scottish ancient universities, the London colleges, the Civics and the 1960s generation of New Universities. In the main they all have a substantial commitment to research as well as teaching at both undergraduate and postgraduate levels, and many are among the leading universities worldwide. The new universities that have been created by the Thatcher government and subsequently are not USS institutions. Since historically most of them were formerly polytechnics or other kinds of colleges in the local government sector, their staff are members of the Teachers Pension Scheme, which is an unfunded government scheme. It has been remarked that if the proposed changes to USS go through, and it closes to DB accrual,
I am not going to discuss the USS dispute or the JEP report here in detail. That would be a good subject for another CSFI round table which I hope can be organized soon.

I will argue instead more generally that our poorly designed regulation system is a policy mistake on a grand scale. Specifically by prioritising the statutory funding objective, which is supposed to ensure every scheme has enough assets to cover its technical provisions, it fails to give a clear picture of the health of an open pension scheme, and is problematic in two ways. First it is not transparent, because it focuses on a poor indicator. Second, and worse, it greatly exaggerates risk, that has to be dealt with at great cost. I will argue against this monistic approach and for economic pluralism in the monitoring of pension schemes, looking at them in the round, using a range of criteria, not simply balance sheet valuations of assets and liabilities on a mark-to-market basis at a moment in time.

I will also argue that an effect of the regulatory system is to allow circular reasoning where the assumptions that are made in valuing liabilities are self-fulfilling. Pessimistic assumptions lead to negative outcomes. Schemes end up being forced to close as a result of over-prudent assumptions.

A third important line of criticism of the current regulatory regime, that is often ignored, is that, besides limiting pensions provision for millions of people, with consequent erosion of the social fabric due to poor support for the elderly, it is also doing substantial macroeconomic damage, hampering economic growth. I will show that this is the result of the adoption of false economic theories over empirical evidence.

**Pensions are an income not a capital amount**

A pension is an income for life during retirement that has to be provided for during an individual’s working life. But goods and services that are consumed during retirement – the real brass tacks of what a pension is - cannot be provided during working life for numerous obvious reasons. First we cannot simply assume that every individual has a well

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4 The terms of reference and the first Report of the Joint Expert Panel can be downloaded from [http://www.ussjep.org.uk](http://www.ussjep.org.uk)

5 Dating largely from the Pensions Act 2004 that created the Pensions Regulator and Pension Protection Fund, and regulations subsequently applied by the regulator.
articulated plan for their spending and saving behaviour over their lifetime, as theoretical economic models often do. It is unreal to assume every individual is born with fixed preferences about their consumption and saving over their entire lifetime; the practical usefulness of thinking in that way cannot just be assumed, but needs to be demonstrated. It is more realistic to assume a person does not really know what their demands will be during retirement since they have very little knowledge of life in retirement until it happens, also how much they need to save for retirement, and so on. Also retirement is a single irreversible life event and cannot be repeated if mistakes are made. Therefore retirement is all about imperfect information and not something that can easily be modelled as a market transaction under the rubric of homo economicus.

Second, with a few exceptions, it is obvious that most goods cannot be stored physically. One could imagine squirrels doing it but not humans. A pensioner’s daily bread has to be freshly baked when it is needed and cannot be stored away for years until needed, after having been purchased during working life. And if storing goods for consumption in retirement is impossible as a practical matter, storing services is inconceivable. One has to purchase personal services such as holidays, medical treatment, social care as they are needed using cash. All this is obvious.

It follows that almost all pensions – conceived of as a stream of goods and services consumed by the retired - must be supplied by the workforce as they are needed. In this — basic - sense all pensions should be conceived of as pay-as-you go. This requires transactions between generations. Looking only at pension scheme funding, as the regulations require, does not directly address the question of how the goods and services demanded by pensioners will in fact be provided. It is here that the lens should be focused if regulation is to be properly transparent.

There is a missing extra step which the present funding approach of comparing assets and liabilities totally ignores: how asset values get converted into pensions as income to pay for goods and services consumed. A scheme may be 100% funded in 2018 but that tells us little about whether the income the assets will provide in 30, 40 or 50 years from now will be enough. All sorts of developments may have occurred in the intervening period including demographic and macroeconomic changes. What the regulations should be asking is how the assets in a fully funded scheme will ensure that pensioners have enough money to pay the future workers they will employ to satisfy their wants. That means actuaries forecasting future developments using all available information. The
currently required approach, by contrast, assumes that asset prices contain all future relevant information, citing simplistic financial economic theory, which, as I will show in the next section, is not transparent.

This is without considering the problems inherent in estimating a capital figure for the liabilities based on the rules of the scheme with forecasts of earnings, inflation, mortality, and so on. All of these can be forecast on prudent assumptions made by the trustee. The regulations require that the resulting time series of benefit forecasts for every year from the present into the distant future be converted into a single capital sum, using the discounted present value method. The estimated present value of the liabilities is a wholly artificial construct which depends above all else on the choice of discount rate. Valuing pension liabilities raises many difficult and even unsurmountable theoretical problems which have been described and discussed by Jon Spain in his presentation.

**The wrong indicator**

The problem with the regulations (and the way they are applied) is that they focus on a comparison of capital values – assets valued at market prices versus a capitalized liability estimate - rather than a comparison of income – from contributions and investments – with benefit payments. But comparing assets and liabilities is a balance sheet matter and not the same as ascertaining whether there will be enough money to pay the pensions when they are due, which is a question fundamentally about budgeting income and outgo.

The theory behind this approach is the expected future dividend model.\(^6\) In the idealised world assumed by finance theory, asset prices are equal to expected future earnings discounted to a present value at the appropriate rate. Theoretically there is a one-to-one relation between asset prices and the earnings out of which pensions are paid. But in the real world that theory is not true. Research spanning many years by the Nobel-laureate economist Robert Shiller of Yale University, and others, has demonstrated that that model of asset pricing is lacking an evidential basis.

This is shown clearly in the diagram below\textsuperscript{7}. It shows two historical time-series plots for US equity prices: the actual stock prices (heavy irregular curve labelled $P$) and the ‘clairvoyant’ or perfect foresight values, constructed from historical dividend payments, as the discounted present value of future dividends (dashed smooth curve labelled $P^*$)\textsuperscript{8}.

The theoretical model says that the two graphs should be pretty much the same. Prices should be the expected discounted present value of future earnings, with expectations based on all publically available date at the time. Yet they are strikingly different. The perfect foresight price graph is relatively smooth. It is smooth for two reasons, first, because it is constructed using the present value formula, a type of moving average of a long series comprising all future dividend payments, suitably discounted. Second, the future dividend payments themselves tend to have followed the growth of the economy and have not varied dramatically around a trend. But on the other hand, market prices are very volatile. This a massive difference and quite significant.

The efficient markets theory says that market prices ought to be less volatile than the perfect foresight value. As Shiller puts it, “Assuming that stock prices are supposed to be an optimal predictor of the dividend present value, then they should not jump around erratically if the true fundamental value is growing along a smooth trend. Only if the public could predict the future perfectly should the price be as volatile as the present value, and in that case it should match up perfectly with the present value. If the public cannot predict well, then the forecast should move around a lot less than the present value. But that is not what we see in Figure 11.2.” (Irrational Exuberance, p 211)


\textsuperscript{8} The graph shows the real, inflation adjusted, S&P Composite Stock Price Index, 1871-2013, and present values, 1871-2013, of subsequent real dividends calculated using a constant discount rate, according to the efficient markets theory.
The graph shows that instead of actual stock prices ($P$) being less volatile than the perfect foresight prices ($P^*$), as the efficient markets theory states, in fact, they are more volatile, and considerably so. This is a striking finding, not only because the direction of the difference is opposite to the theory, but also because it is such a large effect.\(^9\)

In a later analysis of the same data, Campbell and Shiller estimated that 27% of the annual return volatility of the U.S. stock market might be justified in terms of genuine information about future dividends. Later Campbell and Ammer, using similar methodology and a different, more recent data set, found that 15% of the variability in monthly returns in the U.S. stock market could be attributed to genuine information about future dividends.\(^{10}\)

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\(^9\) This is for equity markets. Shiller, in *Irrational Exuberance* shows excess volatility exists in bond and real estate markets as well.

It would be hard to imagine there being stronger evidence against the efficient markets theory than this. Normally when a scientific theory is so decisively refuted when confronted with evidence it would be rejected - and anyone relying on it as authority would no longer be given credence. Yet, although Shiller’s findings were originally published as long ago as 1981, and moreover prominently so, in the most prestigious and widely read academic economics journal in the world, the American Economic Review, it did not happen in this case, at least not as far as financial economists are concerned. More seriously, if policy makers have also ignored such strong evidence and gone ahead with designing regulations based on a theory that flies in the face of the evidence, that is surely unethical.

The evidence leads us to conclude that there is only a very weak relation between the value of assets at market prices and future earnings, and moreover that asset prices are a very noisy indicator of the investment income that is likely to be available to pay pensions.\(^\text{11}\)

A valuation methodology for assessing the condition of a pension scheme that relies on a comparison of asset values with a capitalization of the liabilities, is lacking in transparency for two reasons.

First capital values are imperfect indicators, for both the assets and liabilities, whatever discount rate is used to compute the liabilities. How asset values get translated into pension income remains an open question. The efficient markets theory merely postulates a one-to-one relation between the price of an asset and its earnings, sidestepping all sorts of real-world complications with an assumption of perfect markets, specifically ignoring excess market volatility.

Second, because the market values of assets are excessively volatile, basing valuation on them, rather than the underlying earnings, means treating the volatility as risk, thereby overstating risk by the extent of the excess volatility.

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\(^\text{11}\) I am only talking about asset earnings here. In an open scheme there is also contribution income paid by members and employers. This is particularly true of the USS where, because it is a very young scheme, the pension benefits in payment (£1.8 billion in 2017) are currently completely paid for by the contributions (£2.0 billion), and investment income (£1.5 billion) is not immediately needed and is re-invested.

https://www.uss.co.uk/how-uss-is-run/running-uss/annual-reports-and-accounts
Circular reasoning

A second failing of the current system of regulation is that it often results in the closure of schemes on the basis of what amounts to *circular reasoning* or self-fulfilling *expectations*. Many schemes have been forced to close when their actuary has told the trustees that there is an actuarial deficit so large that the recovery payments required were beyond the sponsor’s capacity to continue to support them. But this could be circular reasoning, resulting in a mistaken decision.

The liabilities figure is constructed on the basis of a number of assumptions about future developments known as the technical provisions. One of them is the choice of discount rate, which the regulations state “must be chosen prudently, taking into account either: the yield on assets held by the scheme to fund future benefits and the anticipated future investment returns; and/or the market redemption yields on government or high quality bonds.”¹² In choosing this discount rate the trustees are essentially making a judgment about the likelihood of a market downturn happening just at the same time as pensions need to be paid, putting extra demands on the sponsor to step in with extra cash. If it is assumed that the sponsor cannot do that, then avoiding it requires a very prudent investment strategy, based on low volatility assets such as bonds, enabling a very prudent valuation using a low discount rate; the result is a high figure for the liabilities.

It follows that if the reason for a deficit is that the liabilities are inflated because of the use of a very low discount rate due to an over-prudent assumption about the sponsor covenant (leading to an over prudent investment strategy in low-return gilts to match), that is really circular reasoning: the liabilities valuation is so high because of an assumption that the sponsor could fail as a result of the scale of those same liabilities, making that failure virtually inevitable.

There is evidence that this is what is behind the USS deficit where liabilities are based on a gilts discount rate The USS is a multi-employer scheme (a so-called last-man-standing arrangement whereby all the member institutions, mainly the more than sixty pre-

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¹² The Pensions Regulator, *Funding Defined Benefits, Code of Practice no. 3*, July 2014. It is important to point out that the pension regulations do not require the liabilities to be valued in the same way as the accounting regulations, which require the use of the rate of return on long term gilts or AA corporate bonds. Interest rates are currently extremely low due to the government policy of quantitative easing.
92 universities – including the most distinguished higher education institutions of the UK – are collectively responsible and therefore has minimal risk of failing, outside of some kind of unprecedented extreme event. Yet the story coming from the latest valuation, according to the USS management, that it is, in effect, becoming unaffordable or outside the employers’ risk appetite, is a direct result of the over-prudent, gilts-based discount rate chosen in the technical provisions and associated de-risking, exaggerating the liabilities.\textsuperscript{13}

Such reasoning should not be taken as evidence of an unsustainable deficit since it is circular. It is based on a self-fulfilling expectation. It is to assume a result, build that assumption into the valuation methodology and then to find the result initially assumed. Had the liabilities been estimated on the assumption that the covenant was \textit{strong}, enabling the assets to be invested in high return equities instead of low return bonds, and a higher discount rate chosen accordingly, the deficit would have been deemed sufficiently smaller for the scheme to be sustainable. Although equities are conventionally assumed to have high short term volatility compared to bonds\textsuperscript{14} this would not matter because investments would be held long term to match the long term pensions commitments.

**Macroeconomic consequences**

The current valuation methodology has serious macroeconomic implications which are rarely discussed. First, the large deficit recovery payments that the sponsor has to make takes demand out of the economy and is therefore recessionary. While deficits are valuations, and arguably notional, since they are differences between capitalized sums, the regulations treat them as if they are real and require the sponsor to make recovery payments in real money. The FTSE 100 companies alone have made deficit recovery payments of £150 billion over ten years\textsuperscript{15}. This, in effect, forced increase in saving, means

\textsuperscript{13} This is essentially what all the discussion surrounding Test 1 is about. See First Actuarial, Progressing the Valuation of the USS: Report for the UCU, September 2017. https://www.ucu.org.uk/media/8705/Progressing-the-valuation-of-the-USS-First-Actuarial-Sep-17/pdf/firstactuarial_progressing-valuation-uss_sep17.pdf

\textsuperscript{14} The view that equities are inherently risky and bonds riskless is held virtually without question by many and is taken to be axiomatic in financial economics. However it is not uncontroversial, and there is published evidence to the contrary. See Baker, Nardin L. and Haugen, Robert A., Low Risk Stocks Outperform within All Observable Markets of the World (April 27, 2012). Available at SSRN: https://ssrn.com/abstract=2055431

\textsuperscript{15} https://www.lcp.uk.com/media-centre/2017/08/150bn-contributions-do-little-for-ftse-100-pensions/
spending power is taken out of the economy with a resulting loss of effective demand, limiting economic growth in the short run.

Second, this requirement for deficit recovery payments creates an incentive for sponsors to limit investment expenditure on capital formation in order to channel funds into the pension scheme. This is damaging for productivity and hits long run economic growth with a consequent loss of GDP.

Third, it also makes DB pensions more expensive to provide. That leads to under-provision of decent pensions and, in the long term, social and employment problems when many workers cannot afford to retire at the end of their working life. This creates pensioner poverty with more dependence on support from the state. This is also going to be a major problem for employers when they increasingly find it harder to manage their older work force many of whom cannot afford to retire and wish/need to continue working.

**Summary and conclusions**

The current system of pensions regulation around the statutory funding objective, using mark-to-market asset valuations, lacks transparency, for open schemes, because it focuses on assets rather than the earnings those assets yield, from which the pensions are paid, and asset prices are only very weakly related to future earnings. It overstates risk because asset prices are very much more volatile than earnings, and therefore valuing pension schemes by them means giving undue significance to volatility. Excess volatility means excess risk. Much of the risk to which pension schemes are subject is an artificial construct of the system of regulation.