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THE PAST MIRROR: NOTES, SURVEYS, DEBATES

Institutional equity investing in Britain from 1900 to 2000

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In Britain around 1900, established financial institutions for long-term savings such as life assurers, and pension funds which were just in their formative phase, did not make material allocations to publicly quoted equity markets or ordinary shares; long-established life assurers, for example, had less than 3 per cent allocated to the asset class (Baker and Collins 2003). Over the following 100 years, this picture radically changed, with equities emerging as the central asset class for many institutional investors and the term 'the cult of (the) equity' was coined (Scott 2002; Avrahampour 2015). As the century progressed, institutional investors superseded private individuals and became the dominant holders of British publicly quoted companies (Cheffins 2010). Despite the attractions of the asset class and their generally high returns, within a relatively short period by the end of the century, institutional equity exposure had peaked and was in decline both at life assurers and within pension funds. Here we highlight, and link together, the key actuarial (Turnbull 2017) and investing (Morecroft 2017) ideas that were influential in these developments. We also identify the main individuals who were instrumental in the application of equity investing to institutional portfolios. The article has an emphasis towards years from 1920 to 1960 when most of the changes to investment practice and actuarial theory occurred.

Keywords: equities, actuary, investment, Keynes, life office, Defined Benefit pension fund

JEL classification: B2, G1, G2, N2

I

The Industrial Revolution in Britain began around 1760 but it was not fuelled by risk capital raised in public equity markets. Most corporate investment capital, of both equity and debt, was raised privately. In terms of securities, bonds dominated the market by number of issues and trading volume. Towards the end of the nineteenth century more than 90 per cent of the business of the London Stock Exchange was still transacted in fixed interest securities, principally the bonds of the British government,

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overseas borrowers and railway companies (Crouzet 2013). Closed-ended funds (investment trust companies), established in large numbers during the last quarter of the nineteenth century, as dedicated investment companies, normally preferred any investment apart from ordinary shares (Baker and Collins 2003). The Foreign & Colonial Investment Trust, for example, established in 1868 and generally regarded as the first investment company, made its first investment in ordinary shares only in the 1920s (McKendrick and Newlands 1999). In 1900, holdings of ordinary shares by the numerous, about 200, life offices were insignificant, amounting to less than 3 per cent of their entire investments, as they favoured mortgages and debentures (Baker and Collins 2003). Pension funds did not exist in large numbers and those that did usually adopted the investment habits of the life offices, not least because they typically had very restricted investment powers (Cheffins 2010). In the early part of the twentieth century, private UK individuals owned an estimated 80 per cent of the ordinary shares traded on the London Stock Exchange; by 1991, British pension funds' and insurance companies' ownership of UK quoted shares peaked at 51 per cent (up from 12 per cent in 1957; down to 39 per cent by 2000): private individuals had been net sellers and the institutions net buyers throughout the century (Cheffins 2010). The data used in this article have generally been taken from secondary sources and we have not attempted, deliberately, to provide a detailed statistical analysis, or comparison, of the broad trends we have identified. Towards the end of the period under analysis extraneous factors, both the de-mutualisation of life companies and also the increasing maturity of some Defined Benefit pension funds together with a growing emphasis on asset/liability modelling, would have influenced asset allocation decisions: we note these changes but do not attempt to analyse them in a granular manner.

Investing in equities would be a post-World War I twentieth-century phenomenon, not a nineteenth-century one for institutional investors. In terms of materiality, life offices began investing in equities during the 1920s and pension funds in the 1950s, while the superannuation funds of local authorities were even prohibited from investing in ordinary shares until the late 1950s (Cheffins 2010). Investment was predominantly in domestic UK equities. During the first half of the twentieth century, owing to a combination of major conflicts and the sporadic functioning of the Gold Standard, direct investment in overseas equities had difficulties. During the second half of the century, foreign exchange controls existed between 1947 and 1979, which created legal and practical barriers that restricted overseas investment because it was either difficult (there was a limited 'pool' of foreign currency) or expensive (a foreign currency premium applied) (Cheffins 2010). After 1979 investment in overseas equities increased rapidly, for pension funds from 5 per cent exposure in 1979 to 24 per cent in 1993, whereas exposure to UK equities had plateaued at about 50 per cent, so at that date around 1980, with hindsight it seems overseas equities were considered a different asset class from domestic equities (they are not) (UBS 2017).

Ross Goobey, investment manager at the Imperial Tobacco pension fund from the 1940s to the 1970s, has long been associated with 'inventing' equity investing, or being the 'father of the cult of the equity', and it is factually correct that Defined

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Benefit pension funds were heavily exposed to equities during the latter part of the twentieth century (Rutterford and Hannah 2016). Ross Goobey was a powerful communicator and self-publicist with a strong idea, 'the reverse yield gap', so it is not surprising that he has become closely associated with equity investing. In practice, this over-simplifies his thinking because he advocated investment in real assets and over time began to favour property rather than ordinary shares, writing in October 1973 'you probably know that I have been off equities for the past two or three years, and we are investing practically all our money now in Property'. We argue that Ross Goobey's asset allocation thinking was preceded in the 1920s and 1930s by two people: John Maynard Keynes and Harold Raynes (a third person would be the American Edgar Lawrence Smith, whom we discuss later in the article). Keynes was chairman at the National Mutual Life Assurance Society, while Raynes was the Chief Actuary at the Legal & General. Keynes had an economist's intuitive attraction and feel for equity investing, while Raynes adopted an analytical and numerical stance towards investment decisions. Keynes and Raynes applied their ideas to life office investment (and Keynes also applied similar investment principles at the endowment fund of King's College, Cambridge, and the Independent Investment Company, an investment trust). It was natural for Ross Goobey to adapt these ideas to pension fund investment strategy in the changed conditions after World War II, when inflation rather than deflation became the norm. Scott (2002) highlighted the moves into ordinary shares by insurance companies, and his paper deserves to be better known.

Two major forms of long-term investment institution emerged in the nineteenth century: the mutual life assurance society, generally referred to as a life office, and owned by its with-profit policyholders; and the Defined Benefit pension scheme, a vehicle for the advance funding of private sector pension provision via a trust structure. Both these forms of institution had distinctly long-term liabilities that were also quite illiquid in nature, particularly relative to the typical liabilities assumed by banks. The financial management, including the overall investment strategy, of both these types of institution was heavily influenced by the British actuarial profession, which itself fully emerged over the course of the nineteenth century. Other influential savings entities such as investment trusts and unit trusts (Burton and Corner 1968) did not have long-term liabilities nor the same interplay between actuaries and investors, so we make only passing reference to their investment practices in this article and as the twentieth century progressed, investment trusts and unit trusts were dwarfed in size by pension funds and insurance companies (Cheffins 2010). Their assets grew at a remarkable pace in the twentieth century largely owing to their attractive tax characteristics, which persisted into the 1980s for life assurance and into the 1990s for pension funds. Beyond the scope of this article, but to be noted, are the important changes that took place in regulation, governance and investor protection which improved the attractiveness of equities as an asset class during the second half of the twentieth century, in particular with the Companies Acts of 1948 and 1967 together with improved listing requirements imposed by the

London Stock Exchange (Chambers 2014). The next section discusses how the appetite for equity investment developed and matured in these life offices and pension funds, the particular role that actuaries played together with practical decisions taken by investment professionals. For the purposes of this article we have defined 'equity' and 'equities' as ordinary shares, so essentially publicly listed companies, and have not used the actuarial definition which considers all risk assets other than bonds and cash, but including property, as equity.

II

Throughout the nineteenth and twentieth centuries, the strategic asset allocation of British life offices was heavily influenced by actuarial considerations. In the nineteenth century, life office liabilities were largely fixed in nature (especially relative to the later twentieth-century bonus-loaded variant of with-profit policy) and surplus capital was relatively modest (again in comparison to the second half of the twentieth century). As a result, the actuarial appetite for investment risk in these institutions was very low. Actuaries were focused primarily on mortality rate modelling and liability reserving methods through much of the nineteenth century and displayed little interest in asset strategy beyond ensuring it was highly prudent. This started to change in the second half of the century and some influential investment papers appeared in actuarial journals. The most important of these papers was written in 1862 by A. H. Bailey (who would go on to become president of the Institute of Actuaries from 1872 to 1874) (see Bailey 1862). His paper, at a mere five pages, was strikingly short by actuarial standards, but formed part of the actuarial exam syllabus for the following 50 years. Bailey's paper was perhaps the first formal articulation of a portfolio theory for long-term investing institutions.

Bailey set out a handful of principles which he advocated as a guide to the life office investment strategy. They encapsulated two fundamental ideas: first, that investment risk should be minimised as far as possible; second, that life offices should take advantage of the relative long-term and illiquid nature of their liabilities by investing in (low-risk) illiquid assets that offered an extra yield as compensation for their lack of liquidity. These principles reflected and influenced the life office asset strategy of the period. Life offices invested almost entirely in fixed income assets throughout the century, and gradually switched from (liquid) gilts to (illiquid) mortgages and other loans of high credit quality. Whilst World War I altered the liquidity profile of life office assets, prior to the 1920s, the dominance of fixed income assets within British life office investment strategy was continuous and near total.

From 1921 to 1938 Keynes was chairman of the National Mutual Life Assurance Society, a medium-sized British life office. As chairman, Keynes's annual speeches to the society, which included detailed references to investment policy in general and equity investing in particular, received widespread coverage in the national media including *The Times* and *The Economist* (Morecroft 2017). He, along with a

small coterie of like-minded individuals in the actuarial community, most notably Harold Raynes, the Chief Actuary of Legal & General, began to change attitudes towards investing within life offices during the 1920s and 1930s. Of particular note was Keynes's speech in January 1928, which described the approach of the National Mutual to equity investing, in which he argued that life offices should invest in a mixture of real and monetary assets (Keynes 1928). Coincidentally, this speech by Keynes was sandwiched between an important paper, 'The place of ordinary stocks and shares in the investment of life assurance funds', by Raynes from November 1927 and the discussion of that paper at the Institute of Actuaries in March 1928 (Raynes 1928). While there is no evidence to suggest Keynes directly influenced the actuarial profession and its leaders such as Raynes, nevertheless, Keynes's Chief Actuary at the National Mutual, G. H. Recknell, was an active participant in the profession's regular sessional meetings, and spoke in favour of life offices making equity allocations (Turnbull 2017, p. 192). Thus, Keynes might be characterised as a force which acted upon the actuarial profession from a distance, though it is somewhat curious that there is no specific mention of him in the actuarial papers from the 1920s and 1930s. The actuarial journals tended to be focused on technical topics of interest to the profession and Keynes never engaged with such particular items.

Keynes was a lifelong believer in the benefits of investing in ordinary shares: this appeared to be an intuitive preference given that he had been investing in equities from an early age even when earning only a modest salary as a civil servant (Kent 2012; Morecroft 2017). The predilection of Keynes towards equity was further reinforced by the events of World War I, which destroyed the financial base of most European governments and undermined the credit-worthiness of bond markets. Keynes's investment beliefs matured further with the publication of *Common Stocks as Long Term Investments* by Edgar Lawrence Smith, the US investor, in 1924. This book analysed the performance of US bonds and equities from 1866 to 1922. It showed that equities had produced better returns than bonds in periods of rising and falling prices. Additionally, Smith pointed out that equities had produced a higher income than bonds straddling both inflationary and deflationary environments. Smith provided, for the first time, a substantial empirical analysis of the long-term performance of equities. The beginnings of the cult of equity should be dated to the publication of Smith's book and its practical endorsement by Keynes.

In essence, Smith's book provided an early empirical statement of the equity risk premium, which Raynes analysed in a UK context. Raynes's paper, 'The place of ordinary stocks and shares in the investment of life assurance funds', submitted to the Institute of Actuaries in 1927, argued that investment in ordinary shares could combat the effects of inflation and would, in all likelihood, produce higher returns than fixed interest securities, though in practice, Raynes argued for a balance of investments between both main asset classes to combat inflation and deflation.

After World War I Raynes was extremely concerned about inflation, which he saw as a greater problem than deflation, as he wrote in his 1927 paper:

> In the long run, however, I doubt whether currency appreciation [deflation] is as important a consideration from our point of view as is currency depreciation [inflation]. The great landslides in currency value have proved to be propositions too big for governments to tackle and in consequence history shows a tendency over long periods of continuous devaluation of money [i.e. inflation].

And he foresaw asset classes displaying different patterns of returns: 'In a period of depreciating currency [inflation], assuming a constant rate in the production of goods, the debenture holder must necessarily suffer, while the ordinary shareholder benefits at his expense' (Raynes 1928). And, anticipating Ross Goobey's arguments in the 1950s about the reverse yield gap, in the same article, Raynes posed an important question about the relative values of ordinary shares and fixed interest securities:

> when one considers the rising nature of the income from our [notional] fund invested [between March 1912 and March 1927] in ordinary stocks it does seem paradoxical that the market should value each unit of that income at a lower figure than a unit of the so-called fixed income from the debenture fund.

Within long-term savings institutions, Keynes was in the vanguard of equity investing even before he had seen the empirical justifications from Edgar Lawrence Smith, or the British actuary Harold Raynes. In 1924 the National Mutual, where Keynes was chairman and led investment decision-making, had 25 per cent of its assets invested in equities: more than any other British life office (Baker and Collins 2003). Keynes (and Raynes) argued that life offices had a duty to their policyholders to enhance their investment capabilities:

> a well-managed mutual society where all the profits belong to the policyholders, is surely the ideal institution for the investment of small annual savings. If only the mutuals of this country can improve their principles of investment as successfully as they have perfected actuarial science, their social usefulness will be even greater than it has been hereto. (Keynes 1922, annual report to policyholders)

Keynes's investment style during the 1920s was driven by an approach that made aggressive tactical asset allocation shifts across a wide range of asset classes as dictated by his macro views including equities, currencies and a range of commodities. His equity investing style was top-down, firstly driven by liquidity, so as to enable these tactical asset allocation changes between asset classes (in the absence of today's liquid derivative markets). Equity stock-picking was not a major contributor to his investment results in this period. For example, in June 1924, the National Mutual held what Keynes described as an 'industrial index' of 29 large cap stocks across six industrial sectors. Essentially, the portfolio was organised around sectors to enable Keynes to implement macro views as and when he wanted to make portfolio changes (Morecroft 2017).

Remarkably, a large part of Keynes's chairman's speech to the annual general meeting of National Mutual policyholders in January 1928 addressed the subject of investment in ordinary shares because, as he explained 'we have been pioneers amongst life offices in the practice of employing substantial part of our funds in the purchase of ordinary shares'. Thirty years later, George Ross Goobey, the person who is often regarded as the progenitor of what is commonly referred to as the 'cult of the equity', said: 'in a speech of historical interest delivered at the AGM in 1928 Lord Keynes was more specific and propounded at length with eloquence and astonishing foresight the case for an active investment policy and for investment in ordinary shares "within the due bounds of prudence"'.[1] On this evidence, Keynes was a generation ahead of his investing contemporaries, including Ross Goobey. Following the 1929 Crash, Keynes's investment style became more focused on equities as his preferred asset class for long-term investing with a 'bottom-up' rather than a 'top-down' approach. This reduced the need to focus on liquidity and his investing style was based on a more fundamental, research-driven stock-picking approach; he referred to his favourite stocks as his 'pets'. This development of his investment thinking, mainly in the context of King's College, Cambridge, and aspects of his investment role at the Provincial insurance company, has been analysed in detail (Chambers and Dimson 2013; Chambers, Dimson and Foo 2014).

As a distinguished economist, Keynes was fully cognisant of the price instability after World War I during the 1920s, but this did not appear to represent an explicit component of his thinking about investing in the same way as it did for Ross Goobey in the 1950s with his pathological dislike of government bonds at the Imperial Tobacco pension fund. Conversely, as noted earlier with Raynes, the inflation-hedging argument in support of equities was particularly important to actuaries within life offices during the 1920s. The extraordinary volatility in inflation rates during and after World War I had taken actuaries and other investors by surprise. It highlighted the utility of backing long-term liabilities with 'real' assets. Although life assurance liabilities were entirely specified in money terms, there was a view that with-profit policy bonuses should have a significant real element. The post-war increase in long-term gilt yields that followed life offices' substantial wartime increases in gilt holdings highlighted to actuaries that long nominal bonds could be a volatile and risky asset class. And at this time, there were no index-linked gilts. In the universe of liquid securities, there were few candidate real asset classes of scale other than equities. In February 1928 the chairman of the Pearl Assurance Company said:

> the effects of war in matters of finance have taught us … that it may be safer to have a proportion of our investments based on the trading results of great and stable corporations i.e. in first class ordinary stocks and shares, rather than entirely on a fixed monetary payment such as is given by … gilt-edged investments. (Scott 2002)

[1] Ross Goobey, Draft review of investment policy for the pension fund, 1 May 1957, London Metropolitan Archive (hereafter LMA)/4481/a/01/001.

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In 1937, Raynes delivered an updated version of his 1927 findings to the Institute of Actuaries, partly, as he explained, to cover the period of the 1929 Crash and Great Depression which had followed his original paper (Raynes 1937). Once again, his analysis cast equities in a favourable light compared to the returns achieved from fixed interest securities over the preceding 10 and 25 years. For the 10 years after 1927, Raynes's voice was the loudest in the actuarial community putting forward the case for investment in ordinary shares. In addition, representing Legal & General he not only supported Keynes during this period but even provided emergency funding during 1932/33 to keep solvent one of Keynes's investment vehicles, the Independent Investment Company, owing to its over-exuberant exposure to the US equity market during the Wall Street Crash (Morecroft 2017). In the inter-war period, Raynes and Keynes significantly influenced life office investment theory and practice. Equity allocations by British life offices increased from less than 3 per cent at the start of the century to 10 per cent by 1937 with several life offices holding more than 20 per cent in the asset class (Dodds 1979). Now that equities were recognised as having a legitimate role in life office asset allocation, a natural actuarial question followed: *how much equity is it reasonable to hold?* And, in particular, *how much is too much?* In other words, what equity risk appetite should life offices have, and what logic should be used to determine this?

G. H. Recknell, the Chief Actuary at National Mutual, the life office of which Keynes was chairman, was one of the first actuaries to address this question. To understand his perspective, we first need to briefly consider the structure of the traditional British with-profit policy of the time. Such a policy would typically be a regular premium contract that matured at death, i.e. a whole-of-life policy, or either at death or a specified term, whichever came first (an endowment policy, and the term would typically be 25 years). The with-profit policy would provide a minimum guaranteed maturity benefit that provided a minimum guaranteed interest rate on the policy's premiums. The policy would also provide bonuses, in the form of an annual addition to the promised maturity benefit that, once accrued, could not be removed. Recknell's view, expressed in 1937 in the actuarial sessional meeting that discussed Raynes's second equity paper, was that the with-profit book's accrued guarantees should be matched with bonds, and only the assets of the fund that remained after this matching exercise should be viewed as eligible for equity investment. These residual assets could be substantial in size for two reasons: first, the policy guarantees may be quite low relative to market gilt yields (what actuaries referred to as a bonus loading); and, second, the life office may have an accumulated pool of surplus capital from a century or more of under-distribution.

Recknell's proposal was straightforward and actuarially prudent. Although it was distinct from the nineteenth-century actuarial view propounded by Bailey that equity investing was simply an inappropriate asset for life office investment, it remained close to the prudent tradition of avoiding risk that could threaten the long-term sustainable delivery of policyholder guarantees. It was uncontroversial,

and, in the 1930s, created the theoretical justification and the flexibility to start increasing equity allocations from a low starting point.

Little more was said on the matter by life assurance actuaries over the following 20 years and what was said tended to agree with Recknell's perspective. For example, in Haynes and Kirton's important 1952 paper on life office investment strategy, the writers 'emphasised our view that the guarantees of future capital security … issued by a life office should be backed by assets providing equivalent guarantees of capital and interest' (Haynes and Kirton 1952, pp. 189–90). This position changed significantly in 1957 when two Edinburgh actuaries, J. L. Anderson and J. D. Binns, published a paper outlining a more adventurous line of thinking on how to set a life office's maximum prudent equity allocation (Anderson and Binns 1957). Their paper noted that the traditional actuarial matching approach would mean that the life office would never be in danger of failing to meet its policyholder obligations (as a result of equity asset performance) even if the equity portfolio fell all the way to zero. They proposed that it would be reasonable to assume some maximum level of equity asset depreciation that was less than the complete wipe-out of the entire equity portfolio, and that this prudently depreciated portfolio value should be allowed for when setting the office's maximum permitted equity allocation. They argued that a 60 per cent fall in the value of equities would be a reasonable assumption. This proportionately increased the maximum permitted equity allocation by two-thirds beyond what was permitted by Recknell's matching approach.[2] This profound proposal generated relatively little actuarial alarm in the sessional meeting discussion, with only one actuary pointing out that the Dow Jones fell by over 80 per cent between 1929 and 1932, and that, with risk-taking in the context of policyholder promises, actuaries should be concerned with 'possibilities rather than probabilities'. Life offices' equity allocations continued to trend upwards in the following years. By 1976, 30 per cent of life office assets were invested in public equity markets (with a further 20 per cent invested in real estate) and equities had become the dominant asset class for British life offices (Dodds 1979). Based on data from Standard Life for the period from 1970 to 2000, exposure to equities peaked during the 10 years from the mid 1980s and reached 80 per cent in both 1987 and 1992. Asset allocation to Fixed Interest (and other monetary investments) was *de minimus* between 1986 and 1992: it was zero between 1987 and 1990, which in this particular case clearly marks the culmination of the 'cult of the equity' (Standard Life 2018). (In the years 2000 and 2001, Standard Life's equity exposure briefly hovered around 80

[2] The Anderson and Binns formula for maximum permitted equity allocation is (Total Market Value of Assets – Cost of Guarantee Matching Portfolio) / k, where k is the assumed maximum equity depreciation. Note the Recknell approach implies k = 1. Those with an interest in option pricing may notice that this formula is now known as Constant Proportional Portfolio Insurance. Whilst Anderson and Binns did not have continuous re-balancing or arbitrage-free pricing in mind, their logic could be viewed as an early precursor of dynamic replication of a put option.

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per cent and had fallen to 37 per cent by 2005 following the TMT crash and subsequent bear market.) There was a similar, though less extreme, pattern of asset allocation by the Scottish Widows' life fund: investment in equities increased rapidly after 1980 when it stood at 42.8 per cent and peaked at 65 per cent in 1989. Similar to Standard Life, Scottish Widows had a materially higher level of equity exposure for the 10 years between 1985 and 1995. Therefore, with both of these major life offices, equity allocation effectively reached a high plateau between the mid 1980s and the mid 1990s.

Government policy and behaviour also had an important influence on life office asset strategy throughout the twentieth century. The two world wars essentially reversed much of the divestment from government bonds that had taken place in the nineteenth century, while ideological political policies of nationalisation and privatisation influenced supply and demand of equity investments. During World War I, to help finance the war British insurance companies were initially encouraged to sell overseas assets and buy patriotic gilts, but when this failed to raise enough money, income on their overseas investments was taxed (Moss 2000). This had a major impact on asset allocation in that aggregate life office ownership of British government bonds increased from 1 per cent of their assets in 1913 to 32 per cent by 1920 (Butt 1984). The British government acted even more quickly and aggressively during World War II as encouragement was replaced by compulsion and once again this had a major impact on the asset strategies of life offices. American investments were forcibly sold by the UK Treasury, rather quickly and mainly during 1940, with the owners compensated with government bonds; but there was no flexibility nor opportunity to negotiate or agree prices of the requisitioned assets (Burns 2008). For the owners of ordinary shares, perhaps even more concerning after 1945 was the policy of nationalisation imposed by the post-war Labour government. This involved taking important industrial sectors, and strategically important companies, into government ownership, so that most of the UK's heavy industries and utilities were nationalised between 1946 and 1950. Equity was exchanged for 2.5 per cent government bonds. Sir Robert Ellis, the chairman of Yorkshire Electric (one of the nationalised companies), did not mince his words, as reported by *The Times*, when he said at his final AGM in February 1948:

> This is hardly an encouragement to invest in industrial enterprise since no one knows upon whom the axe will next fall. The worst phase of the inequity lies in the fact that particular classes [of British society] are being systematically robbed instead of paying them a fair market value.[3]

For Scottish Widows in 1948, the largest British mutual life office at the time, it meant that despite persistent reductions of government bond holdings during the 1930s and in particular in 1946, the net effect of government policies had been to increase that society's exposure to the asset class from 20 per cent of its asset base in 1938 to 30 per

[3] *The Times,* 20 February 1948.

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cent in 1948.[4] Government bond exposure within life offices was therefore back to the levels that had prevailed immediately after World War I and at low rates of interest that made it challenging for them to meet the obligations to their policyholders. Taking the very long view, life offices had been reducing their percentage holdings in domestic government bonds for well over 100 years after 1815, largely as yields fell, and had *de minimus* exposure to the asset class in 1913, only to find this investment policy sharply reversed by government actions owing to two world wars and the political dogma associated with state ownership of publicly listed companies. Political dogma was then turned on its head at the end of the twentieth century. After 1979, the Conservative government introduced the policy of privatisation of state-run companies and this activity expanded rapidly between 1983 and the mid 1990s with the public listing of various businesses: British Telecom, British Gas, Rolls Royce, British Airways and various electricity and water companies (Rhodes, Hough and Butcher 2014). Coincidentally, equity exposure by pension funds and life offices peaked during this particular period too, so perhaps political ideology and the smooth voices of City bankers coalesced at this juncture and also contributed to the cult of the equity. To summarise the data: life office allocations to equities over the course of the twentieth century were negligible in 1900; 3 per cent in 1913; 6 per cent in 1929; 10 per cent in 1937; and 23 per cent in 1965; and peaked, or plateaued, between the mid 1980s and mid 1990s.

A multi-decade era of falling long-term interest rates began in 1981 after the long gilt yield reached a peak of 13 per cent in that year, falling to 0.95 per cent in August 2016. For comparison, the magnitude of this fall was much more substantial than the reduction in nineteenth-century British bond yields from about 6 per cent to 2 per cent (based on Consols). Low rates have an inevitable impact on the economic cost of funding any long-term fixed liability and we will return to this topic later in the article. The first notable consequence of falling rates for British long-term savings institutions arose in the life office sector in the form of their impact on the Guaranteed Annuity Options (GAOs) that attached to many with-profit policies. This had a particularly visible impact at Equitable Life, which was embroiled in a court case in the mid 1990s as a result of its chosen approach to dealing with the cost of GAOs. Across the life office sector, however, a programme of GAO hedging was consequently put in place, mainly using interest rate swaptions, which mitigated most of the impact of further falls in rates on GAO costs (this episode provides the only significant example of UK insurers using derivatives for large-scale liability hedging rather than efficient portfolio management). Life office solvency and equity risk appetite were therefore not significantly reduced directly by the GAO problem across the sector. Nonetheless, the ongoing environment of falling rates fundamentally altered the economics of the with-profit policy in the twenty-first century, and this was one of the key factors in the ultimate demise of the product.

[4] Scottish Widows Annual Report (1948).

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III

Private sector pension fund provision in Britain emerged in recognisable form in the second half of the nineteenth century and grew rapidly in the middle years of the twentieth century (Hannah 1986). The earliest example of a funded scheme for widows' pensions is thought to be the Scottish Ministers' Fund, which was established in the mid eighteenth century. The twentieth-century expansion in employee pension provision was particularly notable after 1921, when contributions to pensions were made exempt from tax. In 1922, local government staff were granted pensions, and, by 1936, 6,544 private sector pension schemes had been established.[5] By 1970, more than half of the entire British workforce was covered by Defined Benefit pension schemes and the tax benefits of Defined Benefit pension funds were particularly attractive after 1945 when the top rate of tax on income was 83 per cent, or higher, until the Thatcher government of 1979 (Cheffins 2010). Approved pension funds also operated as gross investors (they did not pay any capital gains or tax on income) while employers' contributions were not treated as part of earned income and employees' contributions were tax deductible. Given that dividend income for individuals was effectively double-taxed, 'an institutional wall of money attributable largely to tax … accelerated the institutionalisation of the market for shares in UK public companies' (Cheffins 2010).

Early twentieth-century actuarial ideas around Defined Benefit pension fund asset strategy were broadly aligned with the thinking on life office asset strategy. Prior to World War I, pension funds were considered as having long-term fixed, largely nominal liability cashflows that required an asset strategy that could generate similarly long-term fixed cashflows. As was the case with life office asset strategy thinking, it was the period of the late 1950s and early 1960s that saw actuaries develop a framework that readily embraced equities as a core asset class with which to back long-term liabilities. It is notable, however, that the pensions and insurance 'wings' of the actuarial profession in the mid twentieth century developed their thinking and practices without any notable co-ordination of activity or crossover in participants.

An actuarial research paper of 1948 by C. E. Puckridge was the first to propose valuing assets and liabilities by applying the same discount rate to both sides of the balance sheet and basing that discount rate on the expected return of the pension fund's assets (Puckridge 1948). This proposal was, for the actuarial profession of the time, profound and it can be regarded as constituting the first distinctive step in the process of making the major changes to actuarial pension fund methodology that were ultimately highly supportive of an equity investment policy (Avrahampour 2015). However, Puckridge's paper was not primarily focused on the treatment of equity assets (its main focus was the consistent treatment of bond assets and pension liabilities in the context of the low long-term interest rates that were present in the years immediately following end of World War II). Equities are mentioned in only

[5] *The History of Pensions* (www.pensionsarchive.org.uk/82, website accessed 16 June 2016).

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one sentence of his paper, and there only to clarify that the portion of the equity yield that represents a risk premium should not be incorporated into the liability discount rate. It was two papers published in 1961 and 1963 in the *Journal of the Institute of Actuaries* that explicitly developed the idea that pension funds which invested in equities could reduce the actuarial valuation of liabilities by taking into account equities' expected return in the liability discount rate (Heywood and Lander 1961; Day and McKelvey 1963). Such actuarial practices would make pension fund equity investing an attractive proposition for a sponsoring company, as the lower liability valuation could provide a rationale for an immediate reduction in the regular employer contribution rate.

By this time, however, pension funds were already investing significant proportions of their assets in equities. Between 1945 and 1954, UK pension funds' average equity allocation increased from around 10 per cent to 30 per cent, and by the early 1960s it was around 50 per cent (Avrahampour 2015). So the move towards equity investing by pension funds was not driven by specific developments in actuarial methodology. Rather, the chronology suggests that the methodology changes followed the asset allocation ideas about pension fund investment practice largely initiated by George Ross Goobey at the Imperial Tobacco Pension Fund. Nonetheless, the greater volatility of inflation during the war years and into the early 1950s created an actuarial appreciation of the real characteristics of equities relative to long-term gilts. This actuarial rationale was formally presented in 1957 in McKelvey's 'Pension fund finance' paper, which argued that the real nature of long-term dividend growth provided a natural cashflow match for salary-linked benefits, making it a lower-risk asset for an open pension fund than long bonds. As he put it, 'The question now is not, as it used to be, dare we put more than 10 per cent in equities? It is, dare we leave more than 50 per cent in fixed income investments?' (McKelvey 1957).

An actuary by training but an investment manager by choice, George Ross Goobey transformed pension fund investing after 1947 when he joined the Imperial Tobacco pension fund. During Ross Goobey's tenure, pension funds were immature, cash flow-positive and with inflation-sensitive liabilities (during an era of increased inflation volatility). At the start of his tenure, while life offices held a greater proportion of their assets in equities than pension funds, Ross Goobey felt that the undated characteristics of Defined Benefit pension fund liabilities meant they ought to hold materially more in equities than a life office. Additionally, Ross Goobey developed a withering distrust of government bonds during the late 1940s owing to the economic policies of the Labour government in general and the behaviour of Dalton, Chancellor of the Exchequer, in particular (Morecroft 2017). He was clear that pension fund investors needed to break away from the actuarial orthodoxy of the time and supersede life offices' progress in equity investing. Given that life offices dominated the savings landscape by size of assets and life office actuaries filled the most senior investment positions, Ross Goobey was a lone voice challenging the entrenched conventional wisdom. '*The best possible result*' was Ross Goobey's mantra, which led him to argue that his pension fund should be prepared to hold

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100 per cent of the assets in equities. Imperial Tobacco reached about 96 per cent invested in equities by 1961, which represented both a rapid and a significant move from the token 10 per cent that was typical immediately after World War II (Avrahampour 2015). Importantly, many other British pension funds had followed Ross Goobey's lead and the percentage aggregate allocations to equities were as follows: 47 per cent in 1962; 52 per cent in 1970; 54 per cent in 1980; 70 per cent in 1990 and 71 per cent in 2000, having peaked at 81 per cent in 1993 (UBS 2017). Between 1991 and 1996, the aggregate equity exposure was never lower than 75 per cent and, as shown earlier, by the early 1960s actuarial opinion had also swung behind Ross Goobey's position. This broadly coincided with the peak equity exposure of the life offices between 1985 and 1995.

It is improbable that Keynes directly influenced Ross Goobey as an investor but more than likely that Raynes did. There is one reference to Keynes by Ross Goobey dated 1957, in which he acknowledged Keynes's prescience in 1928 about life assurance investment policy, but by that point, Ross Goobey's own views about investing in ordinary shares for pension funds were fully formed.[6] Ross Goobey was a trainee actuary between 1934 and 1936 at Legal & General and Raynes, as L&G's Chief Actuary ultimately his boss, likely would have shaped Ross Goobey's formative thinking about investment during these years (Avrahampour 2015). Probably, therefore, the main influence on Ross Goobey was Raynes, given that they not only worked together but had shared interests analysing capital market returns and increasingly thought more about the assets, rather than the liabilities, of investment portfolios. As an example, throughout the 1950s one of Ross Goobey's fundamental disagreements with Watsons (consulting actuaries to the Imperial Tobacco pension Fund) was their underestimation, in his view, of future investment returns (Morecroft 2017). His major investment insight, or market view, was a belief that after almost 150 years of gradually falling prices, inflation would be a semi-permanent feature of the post-1945 economic world and that real assets, particularly ordinary shares, were the best type of securities to cope with an inflationary environment. In this scenario, he believed that equities should yield less than bonds as future dividend growth would be driven by inflation as well as the performance of the real economy. Consequently, he conceptualised income from ordinary shares as a complex series of dividend flows to be assessed over more than 30 years into the future.[7] He anticipated the equity-bond 'reverse yield gap' which emerged at the end of the 1950s and remained for the following 60 years or so until after the 2008 Global Financial Crisis and the global policy of quantitative easing initiated by central banks.

Ross Goobey's equity investment style was buy-and-retain, rarely selling stocks, and accumulating a portfolio of over 1,000 holdings (an increase of 500 stocks

[6] Ross Goobey, Draft review of investment policy for the pension fund, 1 May 1957, LMA/4481/a/01/001.

[7] Ibid.

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compared to his portfolio in 1955).[8] His investment horizon was 30 years or longer, but in reality the definition of long-term for Ross Goobey probably meant forever, not least because he felt volatility was irrelevant to his investment strategy as a cash-flow positive investor with liabilities that stretched into an indeterminate future. He maintained a strong thematic focus on small-cap and high-yield stocks throughout his investing career, believing that these exposures were likely to produce above-average market returns over the long term. Forty years earlier, Keynes also had a thematic bias towards similar factors in the equity portfolio he constructed at King's College, Cambridge (Chambers, Dimson & Foo 2014). In addition, by the 1930s Keynes's portfolio contained high levels of stock-specific risk dominated by his favourite stocks (his 'pets' like the Austin Motor Company), sector bias towards resource companies and a geographic focus on the US (specifically income-producing preference shares) and South African mineral companies in addition to his UK holdings (Morecroft 2017). Compared to Keynes, Ross Goobey adopted a somewhat different approach to portfolio construction: he eradicated stock-specific risk but loaded up the thematic exposures.

The actuarial arguments in favour of equity investment for pension funds that emerged in the later 1950s and early 1960s were driven by two fundamental beliefs: first, that asset and liability cash flows should be matched; second, that both salary-related pension liability cashflows and dividends are real – hence equities were a good match and natural asset class for open pension funds. It is also notable that the timing of this shift in actuarial outlook on pension equity investment strategy coincided with a particularly rich period of development of important new ideas on the economics of the pricing of risk asset (Markowitz 1952; Sharpe 1964) and actuarial asset-liability management (Redington 1952). With actuarial orthodoxy now aligned with Ross Goobey's investment philosophy and beliefs, pension fund equity allocations continued to follow an upward trend until 1993 at which date 81 per cent was invested in equities (57 per cent domestic; 24 per cent overseas), with another 5 per cent in property, so 86 per cent in real assets (Holbrook 1977; UBS 2017).

Only a small minority of actuaries continued to argue that the primary rationale for advance funding of pension liabilities was not to generate a set of cashflows that matched the long-term liabilities, but to ensure that accrued pension benefits could be secured in the event of (possibly short-term) sponsor insolvency by transferring these liabilities to a third party (almost certainly a life office). This alternative perspective on the objective of the pension fund implied an asset strategy that was more defensive and positioned to cope relatively better in the economic conditions that would typically be associated with sponsor insolvency. This view never dominated British actuarial thinking on Defined Benefit pension fund investment strategy, but did have increasing influence towards the end of the twentieth century. The recession of the early 1990s, the Robert Maxwell scandal, and the fall of long-term rates from

[8] Ross Goobey, Speech to the Royal Statistical Society (Bristol Group), 17 February 1955, LMA/4481/A/01/20.

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their peak of the early 1980s all encouraged greater weight to be placed on this 'funding-for-security' argument. Moreover, the equity experience of the 1970s and 1980s also undermined the actuarial premise that real equity dividend growth could be assumed to be stable over the long term – UK dividend pay-outs fell by around 45 per cent in real terms between 1970 and 1974 and did not fully recover their real 1970 value until the late 1980s (Dimson, Marsh and Staunton 2002). A further disincentive to hold domestic equities was delivered in 1997 when taxation of equity dividends for previously tax-exempt investors, principally pension funds, was introduced. Whilst this change did not fundamentally alter the calculus of pension fund asset allocation, it did, on the margin, add new impetus to the rotation from equities to fixed income assets at the start of the twenty-first century.

The sustained fall of long-term interest rates from the early 1980s to the present day has created profound challenges for long-term savers and the institutions that serve them. Defined Benefit pension liabilities, inflation-linked and very long-term, are a form of financial promise that is particularly exposed to this environment. These pension schemes were designed to work with a long-term real interest rate of between 3 per cent and 6 per cent. The contribution rate required to fund the traditional level of final salary pension promise when long real rates are zero or negative is untenably large. This has been one of the major causes of the widespread closure of Defined Benefit pension funds over the last 20 years. As pension funds close and move into run-off, their appetite for equities inevitably diminishes. In the context of the future of pension provision, there was a particularly prescient comment in the Scottish Widows' Annual Report of 1990 to its policyholders:

> This Act [the Social Security Act of 1990] increases the cost of providing benefits in final salary [Defined Benefit] schemes by making it compulsory for certain benefits to be regularly increased. The effect of this legislation will be to persuade a number of employers to alter their pension schemes to money purchase [Defined Contribution].

Aggregate Defined Benefit pension fund equity allocations have been in steady decline since the 1990s. As of 2000, in aggregate 71 per cent was invested in equities by UK pension funds; having peaked at 81 per cent in 1993, by 2016 this figure was was only 35 per cent (UBS 2017).

IV

The twentieth century witnessed the rapid rise and then the beginning of a gradual fall of equity investing by long-term investment institutions in Britain as percentage equity allocations were reduced. Life offices started investing in equities during the 1920s and 1930s owing to the shocks and economic impact of World War I. Thought leadership came from Keynes's investment ideas and the analytical work on long-term capital markets' returns of Smith and Raynes together with evolving actuarial ideas from Recknell. A similar pattern of events followed after World War II with Defined Benefit pension funds, when Ross Goobey favoured equities; he

had an instinctive distrust of government and harboured major concerns about inflation. Actuarial thinking subsequently fell into line around 1960 following the work of Anderson, Binns, Heywood, Lander, Day and McKelvey.

For British institutional investors, equity exposures reached their cultish highs during the last 10 years of the twentieth century, between 1985 and 1995: the decades of falling long-term interest rates that followed from their peak in 1981 inevitably impacted on the financial health and equity risk appetite of both life offices and Defined Benefit pension funds. Both forms of institution have now largely ceased to write their traditional guaranteed liabilities, and their investment focus has morphed towards security, matching liabilities and an orderly run-off rather than attempting to generate high long-term real returns. In practice, financial institutions have been investing in equities for less than a 100 years and, while both our market knowledge and equity investment styles have evolved materially from the early efforts of Keynes and Ross Goobey, there is still much to learn about this relatively new asset class.

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