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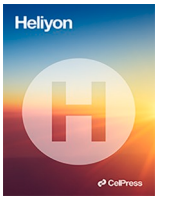

Research article

Pension accounting information and firm value: An analysis of FTSE 100 companies

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ABSTRACT

This study is among the first to take known results in pension accounting and use a sample of UK listed FTSE 100 companies to show that the results are mostly the same as in previous research (on the US companies) into associations between pension accounting information and firm value. We investigate the association between published pension accounting information and the market value of a sample of UK listed FTSE 100 companies in the ten-year period 2006 to 2015. We analyse UK listed firms that report under the IFRS accounting framework (IAS 19), which is a contribution to earlier literature that concentrated on US listed firms that report under the US (FASB) accounting framework that has significantly different pension accounting rules to the IFRS accounting framework. Moreover, the analysis is conducted on a sample of firms that used the method of immediate recognition of actuarial gains and losses in other comprehensive income (or the 'Fair Value OCI method') even before mandatory adoption of this method from 2013. We employ a static panel regression analysis on a sample of 70 companies. Empirical findings suggest that there is an association between pension accounting information and firm value, but in some cases, there is less association than there is between other types of accounting information and firm value. Core earnings are value relevant but overall pension earnings (net) are not value relevant although pension costs, pension interest expense and pension income have an association with firm value. Balance sheet numbers have less association with firm value than is the case for core earnings, pension costs, pension interest expense or pension income.

1. Introduction

This study investigates the association between published pension accounting information and firm value based on a study of UK listed FTSE 100 companies. The aim of this research is to achieve a better understanding of the extent of the association between the market value of listed companies and accounting information about defined benefit (DB) pension schemes recognised and disclosed in the audited financial statements following mandatory adoption of International Financial Reporting Standards (IFRS) in the EU. Value relevance research analyses the correlation between share prices and financial statements over time [1]. As part of this investigation the value relevance of pension accounting information is compared to the value relevance of other accounting information. Specifically, the key research aims are to determine whether pension accounting information is value relevant and whether pension

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accounting information is more or less value relevant than other accounting information.

A major motivation for this study with its particular focus on FTSE 100 companies is that shareholdings in these companies comprise a significant proportion of the overall investments of many individuals, investment funds, unit trusts, pension funds and other institutional investors. This may be because investors see investment in the shares of FTSE 100 companies as relatively safe at a time when interest rates are low and hence returns on other so-called 'safe investments' are also relatively low. A further major motivation for this study is that many FTSE 100 companies have large liabilities in the form of pension scheme obligations yet the extent of the impact on firm value is unknown. Companies that sponsor DB pension schemes for their employees are required to ensure that steps are taken to maintain adequate funding for the pension liabilities with investment in pension assets – nevertheless, in practice these schemes may be in deficit in the financial statements due to variations in pension asset valuations together with changes in various actuarial assumptions such as longevity and the discount rate. DB pension scheme liabilities are based on obligations to pay 'final salary' or 'average salary' pensions that are usually determined according to a formula based on each employee's final salary or average salary (for example average of last three years' salaries) and are dependent on the longevity of scheme members. A crucial feature is that sponsoring companies have a contingent liability arising from potential pension fund deficits although the precise position in any case will depend on the local national jurisdiction and pension laws bearing in mind that many FTSE 100 companies (examined in this research) are multinational entities. Another motivation for the study is that while there are many pension accounting research studies extending back to the 1980s or 1990s, the majority of research studies of pension accounting and firm value use data for US firms reporting under the US GAAP (FASB) framework rather than the IFRS accounting framework and there are major differences such as the requirement for immediate recognition of actuarial gains and losses in other comprehensive income (associated with 'fair value' accounting) under IFRS compared to deferred recognition (associated with 'smoothing' provisions) in the income statement also known as the 'Corridor Method' that is allowed under US GAAP. More recent pension accounting research discusses pension plan assumptions [e.g. Refs. [2,3]] or disclosure quality [e.g. Refs. [4–6]] and this is further motivation for this study to resume the research into the reported pension accounting information and firm value.

This research contributes to the literature: firstly, by analysing UK listed firms that report under the IFRS accounting framework incorporating International Accounting Standard 19 'Employee Benefits' (IAS 19) that was introduced in 2004 and amended in 2011, rather than US listed firms that report under the US (FASB) accounting framework (used by virtually all previous pension accounting value relevance studies); and, secondly, by providing evidence based on a sample of firms that used the method of immediate recognition in other comprehensive income ('OCI') referred to here as the 'Fair Value OCI method' – actually used by all but three companies in the FTSE 100 sample up to 2012 and all companies thereafter.

The research provides an opportunity to consider the possible impact on value relevance outcomes of the differences between pension accounting under IFRS and US GAAP. US firms have a choice between using the Fair Value OCI Method or the Corridor (or 'Smoothing') Method (a controversial topic in the USA) and this was also the case for firms reporting under IFRS (IAS 19) until the amended IAS 19R [7] made the Fair Value OCI Method mandatory for accounting periods commencing on or after January 1, 2013. The other major change introduced by IAS 19R was the replacement of the term for 'expected return on plan assets' and separately disclosed interest cost on plan liabilities with the net interest cost on the net pension liability or asset [7]. The investigation also employs some of the approaches of previous research in the literature and applies these to the UK data in order to provide a direct comparison with the outcomes of the innovative methods employed in this new research.

2. The changing state of DB schemes in the UK

Companies have been closing DB schemes to new members or future accrual so that in 2006 some 43% of DB schemes in the UK were still open but by 2011 only 16% were still open and the trend has remained downwards with a further fall to 13% in 2015 and only 10% in 2022 according to the figures published by the Pension Protection Fund (PPF) which is the UK's statutory corporation to insure against the risks of bankruptcy and failure by sponsoring companies to pay their pensioners [[8], p.7]. Even when DB schemes are closed they are still quite likely to have a significant presence in the sponsoring company's financial statements in the form of continuing liabilities to the 'legacy schemes' unless a sponsoring company takes the major step of paying a sum (often of considerable size) to transfer the scheme to an insurance company as part of a 'pension buy-out'. The extent of the potential problem and the considerable volatility from year to year may be understood by the overall figures produced by the PPF following an examination of PPF-eligible DB pension schemes in the UK. In 2006, for DB schemes there was an overall deficit of £22.7 billion that by 2010 had moved into an overall surplus of £38.3 billion on a so-called section 179 basis (referring to s. 179 of the Pensions Act 2004 and the PPF compensation basis which caps the amount of PPF support representing payments from UK public funds) but this moved back into a deficit of £1.2 billion in 2011 and then a much bigger deficit of £244.2 billion in 2015 before a significant fall to a comparatively modest deficit £12.7 billion in 2019 following a sustained bull market in intervening years, but this deficit widened again to £90.7 billion (representing an aggregate funding ratio of 94.9%) in 2020 and then with a rise in discount rates a surplus of £193 billion (funding ratio 113.1%) was recorded in 2022 [8]. The figures are in any case very different when a 'full buy-out' basis is used, so that the overall deficit for DB schemes in deficit was £607.2 billion in 2006 reducing to a deficit of £543.1 billion in 2010, rising to £583.3 billion in 2011 and again, rising to an even larger deficit of £970.9 billion in 2015 before declining over the years of the global bull market (referred to above) to a still very large deficit of £668.5 billion in 2020 that has since reduced to £438.4 billion (representing an aggregate funding ratio of 79.2%) in 2022 [8]. A deficit calculated on a 'full buy out' basis is the estimated amount payable by a solvent company that does not have to put itself at the mercy of the PPF but transfers the scheme to the private insurance market. At the time of writing there are still market uncertainties following periods of volatility during 2020 and early months of 2021 that witnessed periods of global financial market turbulence and a significant fall in asset valuations associated with widespread economic impact of the

coronavirus variant ID 19 (or 'Covid-19') pandemic. A year and more after the first 'lock-downs' in the UK and many other countries in the first half of 2020, there are continuing concerns about further reported mutations of the coronavirus and it remains to be seen what impact this will have on the funding position of DB pension schemes.

There can be many reasons for increased pension scheme deficits but in recent years the liability side assumptions such as scheme member longevity and discount rates have been particularly significant factors. Longevity estimates have increased over recent years based on research by actuaries and this has led to considerable expected liabilities. Looking at the FTSE 100 companies the average life expectancy disclosed in the published accounts has risen from 86.5 years in 2008 to 88 years in 2014 [9, p.26]. Discount rates have been on a largely downward trend over 10 years or more and even in the midst of the Covid-19 pandemic a rapid rise of 1.5% per annum in discount rates in March 2020 was soon followed by a significant decline to an all-time record low for discount rates at the end of April 2020 [10]. In accordance with the accounting standards the discount rate is established by reference to the yield available on high quality corporate bonds (IAS 19, [11]) and this is still consistent with the revised form of IAS 19 published in 2011 [7]. The yields on high quality corporate bonds estimated using UK 'AA' rated bond yields fell from over 7% in 2008 to between 3% and 4% in 2014 [9, p. 12]. Interest rates have remained low in the UK and many other major economies in recent years and even in 2020 after a period of turbulence referred to earlier rates stabilised at low levels and, since low interest rates are associated with larger DB pension liabilities, less than 60% of FTSE 100 pension schemes were projected to be in surplus [10].

Since 2007 there have been over 50 DB pension scheme buy-in and buy-out deals of over £500 million according to information provided by Lane, Clark and Peacock LLP [12]. Many of these DB pension scheme buy-in and buy-out deals (also described as 'pension de-risking transactions') have been undertaken by FTSE 100 companies that are prepared to invest considerable sums of money in order to take the pension liabilities off their balance sheets. This is an indication of how seriously company boards are taking the matter of major DB pension schemes with their uncertain future risks.

3. Literature review

Value relevance research analyses the correlation between share prices and financial statements over time [1]. Value relevance is believed to be concerned with two accounting attributes of 'relevance' and 'reliability' but is different from the concept of 'decision usefulness' [1]. It may be tempting to presume that value relevance is indicative of decision usefulness, but it is acknowledged that value relevance research can provide only indirect evidence of decision usefulness [13,14]. Value relevance studies originate in work by, for example, Ball and Brown [15] who undertake both event studies and association studies and Beaver [16] who undertakes an event study. Empirical models have their theoretical foundations in valuation research and fundamental analysis, but they are concerned with market value of equity. Fundamental analysis seeks to determine firms' intrinsic values [17]. There are various types of value relevance studies including relative or incremental association studies that are designed to investigate whether particular accounting numbers such as pension income, expenses, assets or liabilities help to explain market equity value or returns over long periods [14].

Pension accounting was one of the first topics to be examined in value relevance studies in the years after the early contributions by Ball and Brown [15] and Beaver and Dukes [18]. Among the earliest studies investigating pension accounting and finance are Oldfield [19] and Feldstein and Seligman [20], whose analysis is based on studies by Modigliani and Miller [21,22]. It has been argued that these are more finance studies than accounting studies [13], so that the first pension accounting value relevance study might be that carried out by Daley [23]. Much of the value relevance research literature is devoted to US firms and the US stock markets although over the past fifteen years or so there has been significant empirical research activity based on European markets particularly since the mandatory IFRS adoption in the EU from 2005 [24,25]. Within the IFRS framework is IAS 19 'Employee Benefits' that is the specific standard for pension accounting that features in some of the literature on value relevance. A number of studies find evidence that IFRS adoption results in increased value relevance in certain aspects of accounting [26,27], while certain studies find evidence that IFRS adoption increases comparability with US GAAP which tends to be associated with greater value relevance [28]. Some studies, such as Devalle et al. [29] have mixed findings with evidence that IFRS increases value relevance in the UK for both income and book value of equity but by contrast, in Germany and France the value relevance of income is found to increase but value relevance of the book value of equity decreases. Other studies that have mixed results include Callao et al. [30], Christensen et al. [31], and Tsalavoutas et al. [32], so that overall, there is a need for caution in assuming that the adoption of IFRS will necessarily result in an increased value relevance of accounting numbers.

Pension accounting value relevance studies may be categorised according to the type of model they use: earnings discount models, balance sheet models or variations of these that include income and balance sheet variables. Daley [23] develops an earnings discount model to try to determine whether there is an association between measures of pension cost disclosed by US companies (as used in the 1970s) and stock market valuations. He finds that reported pension expenses are value relevant. Barth et al. [33] develop the earnings discount model concept by disaggregating the pension components to permit more detailed analysis and they find that the interest cost has a significantly negative firm value association and the return on plan assets has a significantly positive firm value association. Contrary to expectations the service cost turned out to have a significantly positive firm value association (at least in some model specifications). One explanation may be that there is multicollinearity between pension cost components, while another possibility is that the market does not view service costs as a measure for the pension liability. Another viewpoint is offered in Hann et al. [34], who suggest that the positive correlation between share prices and service cost may be attributed to the latter serving as a proxy for value created by human capital.

The second type of model is described as a 'balance sheet model' advanced by Landsman [35]. In this form of model, companies' total assets are divided into 'pension assets' and 'non-pension assets' and the companies' total liabilities are divided into 'pension

liabilities' and 'non-pension liabilities'. Landsman performs analysis using a sample of US companies for the years 1979–1981 and finds that the firm value associations with pension fund assets and liabilities is consistent with corporate assets and liabilities. Dhaliwal [36] studies the impact of unfunded vested pension obligations on 'market perceived risk' of the firm and finds that the effect of unfunded vested pension liabilities is not very different from that of debt and other liabilities.

The third type of model used in the pension accounting association studies looks at balance sheet and income measures simultaneously. Researchers often attribute this approach to the Ohlson [37] model – based on earlier research, such as Ohlson [38]. Barth et al. [39] use a 'combined model' containing income and balance sheet variables in an investigation of the value relevance of pension accounting based on data for 300 US companies for the years 1987–1990. Barth et al. ([39] find that the fair value of pension assets and the projected benefit obligation or 'PBO' (which shares fair value characteristics) disclosed in the notes are correlated with share price valuations, whereas the incremental explanatory value of pension cost components (also disclosed in the notes) has no impact on share price valuations.

Gopalakrishnan [40] considers the relative importance of recognised figures (in financial statements) and disclosed information (in the notes to the financial statements) and he finds that pension information disclosed in footnotes is value relevant with investors apparently attaching equal importance to recognised and disclosed information.

Coronado and Sharpe [41] employ models that combine income and balance sheet variables, but report results that are in sharp contrast to the earlier work by, for example, Barth et al. [39]. Firm value is based on share price in Coronado and Sharpe [41]; and a later study by Coronado et al. [42]– to this extent these studies adopt a similar approach to Barth et al. [39]. Coronado and Sharpe [41] take a sample of US companies comprising the S&P 500 index over the years 1993–2001 using Compustat data for accounting information, and I/B/E/S price and forecast data. This study finds that the pension income and expenses rather than the pension assets and pension liabilities are relevant for the purposes of explaining share prices. In a more recent work, Coronado et al. [42] extend the period of investigation to the years 2002–2005 and they find the same relationship between pension income and expenses and share prices with even more convincing results. Coronado and Sharpe [41] and Coronado et al. [42] express concern following their findings showing that the market focuses on pension plan earnings and costs that are in their view often a very misleading measure of the underlying value of net pension obligations.

Franzoni and Marin [43] take a sample of US firms and using Compustat accounting data for the years 1980–2002 they find that the pension accounting information is value relevant, but they suggest that the stock market investors are effectively misled by the accounting information and do not anticipate the impact of pension liabilities on future earnings. Franzoni and Marin [43] conclude that there is a tendency for investors to overvalue firms that have severely underfunded pension plans over two decades in the USA. In performing their analysis, Franzoni and Marin [43] probe into equity risk and find that there is a positive relationship between pension plan risk and firm equity risk. This outcome is consistent with earlier findings by Dhaliwal [36] and another study by Jin et al. [44] that adds weight to the expectation that equity risk should reflect pension plan risk despite abstruse pension accounting rules. Picconi [45] performs research using a sample of US firms for the years 1988–2001 and finds that the pension accounting information is value relevant, although there is some uncertainty about the way in which that information is analyzed as there are indications that analysts fail to incorporate the quantifiable effects of "relevant and economically significant information" [45, p.951].

Further studies of pension accounting value relevance such as Hann et al. [34], Kiosse et al. [46], Werner [47] conclude that pension accounting information is value relevant. Hann et al. [34] find that fair value pension accounting is less value relevant than the accounting numbers produced under a 'smoothing approach' that allows amortisation of actuarial gains and losses beyond a certain level (an accounting method that is still permitted under US accounting standards but no longer permitted under IFRS). Overall, the extensive research literature mostly devoted to the analysis of US data, sways towards the conclusion that pension accounting information is value relevant. The literature review produces no studies that use panel analysis in research into pension accounting value relevance.

In view of the significant issues arising for DB pension schemes and the challenges faced in accounting for them, it is perhaps surprising that there has not been more extensive research, particularly outside the USA. This literature review refers to a number of pension accounting value relevance studies that use US accounting data. However, studies using UK data in relation to pension accounting value relevance are particularly sparse and the samples are really international firms listed on the London Stock Exchange (see, for example [3,48],). This research study now joins the very small number of pension accounting value relevance studies that use UK (or London Stock Exchange listed firms) data. There have been some useful contributions to the debate on pension accounting in recent years. The quality of financial reporting of pensions has been a theme of discussions for many years with important contributions including Blake et al. [49], highlighting the danger that the reduction of many actuarial assumptions to a single figure may give an 'illusion of certainty'. Gordon and Gallery [50] have commented on the danger of unintended consequences of the revised IAS 19 in the form of comparability that is more apparent than real as a result of removing choice of accounting treatment. Another argument is that discretionary choices in actuarial assumptions may permit a certain amount of earnings management or balance sheet management [51]. Other studies focus on disclosure quality and impact of varied practice arising from discretionary accounting choices, such as Billings et al. [2], Glaum et al. [4]; Nobes and Stadler [52]. More recently, Houmes et al. [5] provide evidence that audit quality may weaken the positive relationship between a DB pension-scheme-sponsoring firm's cost of equity and pension risk. The topic of audit quality is a particularly interesting one as all of the companies in the FTSE 100 sample are audited by 'Big 4' accountancy firms. Stakeholders might be more sanguine if a Big 4 auditor with a strong in-house actuarial department is providing assurance for pension accounting assumptions. The findings of Houmes et al. [5] seem particularly pertinent to the interpretation of value relevance studies in view of the extent of discretion in actuarial assumptions under IAS 19 both before and after the revision to IAS 19 [2]. The scope offered for early adoption of the equity method of accounting in place of the corridor method under IAS 19 (revised) has provided managers with an opportunity (whether taken or not) to adopt more aggressive actuarial assumptions and lower pension liabilities in

the balance sheet as well as reducing pension costs in the income statement [4]. The use of a single net interest cost for the net pension asset or liability as introduced by IAS 19R [7] has been criticised on the basis that pension deficits and surpluses have different economic drivers, different explicit or implicit discount rates and are measured on a different basis [53]. The ongoing debate about these highly complex matters in actuarial science and pension accounting puts a premium on disclosure quality that is so important to the users including investors and regulators who are reviewing the information in financial statements. Naughton [6] looking at the major companies in the USA and Morais and Pinto [3] commenting on the major FTSE 100 multinationals listed in UK (London Stock Exchange) conclude that there is evidence of a positive relationship between regulation and financial reporting discretion. On a more general basis, concerns have been raised about the extent to which fair value accounting has become a feature of the IFRS accounting practice especially where valuations are based on financial modelling more than actual market pricing [54]. These studies suggest that there is still scope for improving disclosure quality in the financial reporting of DB pensions by introducing measures to provide clearer information about: discount rates; other discretionary choices for certain actuarial assumptions; and, financial implications of these discretionary inputs.

There is a substantial research literature on the topic of pension accounting and value relevance – mostly using US-based data. From 2012 there have been relatively few pension accounting value relevance studies and fewer still devoted to UK listed entities although there is an expanding body of research considering the quality of pension accounting disclosures and comparability under IAS 19 (and the revised standard IAS 19R) as discussed above. Part of the motivation to explore the association between pension accounting information and firm value is driven by the extent of the potential pension deficit in the 2020s. This could grow to be considerably larger than the figure of £668.5 billion recorded in 2020 across the 'universe' of PPF-eligible DB pension scheme sponsoring firms in the UK [8]. This is now a matter of considerable public interest as the UK taxpayers are already exposed to the PPF commitments in the event of sponsor company insolvency.

4. Research methodology

4.1. Data

This research uses quantitative methodology by analysing data obtained from published audited financial statements including the notes of UK listed companies and share price data obtained from Thomson Analytics and Datastream over the period 2006 to 2015 (including the first half of 2016 for share price data), a period that is significant as it runs from soon after the mandatory adoption of IFRS from 2005 in the EU countries (including the UK at the time) and permits analysis of the effects of very major events such as the financial crisis in 2008–09 and the period of uncertainty around the time of the UK's 'Brexit' vote in 2016. The data comprise accounting numbers and share price data. The accounting data are extracted from the financial reports of a sample of FTSE 100 companies over the period 2006 to 2015. All the companies are required to apply IAS 19 over this period, so this permits consistency and comparability in the analysis. All but three of the firms in the sample use the Fair Value OCI Method of accounting for actuarial gains and losses that has been associated with evidence of lower value relevance in US studies. The sample contains 70 companies (rather than all 100) due to the fact that certain companies are excluded from the analysis: banks and other financial institutions because these companies have different reporting structures and are not easily comparable; companies that have been the subject of capital restructuring; or have been listed on or exited from the FTSE 100 (within the period from 2011 to 2015 analysis is performed on 44 companies that remain in the FTSE 100); or are very recent additions to the FTSE 100 that once again are not easily comparable to the core group of firms. The sample provides data for 500 firm years after excluding those firms that do not sponsor DB pension schemes or have closed them over the period 2006 to 2015.

Principal sources of share price data are Thomson Analytics and Datastream. Most of the pension accounting data for a firm is contained in the specific pension notes in the audited accounts contained in the annual reports of the sample companies. For that reason, the data is extracted individually from the financial statements and notes. The procedure adopted is to match accounting data of companies with accounting year-ends in October through to March (mostly December year ends) to price data published in the following May; and, accounting data for companies with accounting year-ends in April through to September are matched to price data published in the following November – this follows the methods employed by Coronado and Sharpe [41] and Coronado et al. [42] based on an approach to the matching of accounting data to share prices on one particular date as used in earlier literature [55–57]. There is a potential weakness in this approach to the analysis, especially in periods of high price volatility but this weakness is not considered to be so serious as to require a change in the approach since the share price variations in the 30 days around the end of May 2011 are found to be mostly in the range of 3%–7%.

This study uses UK data and therefore differs from previous research such as that of Coronado and Sharpe [41] and Coronado et al. [42] that examines US data and relies on figures for 'pensions earnings' that are calculated in accordance with US GAAP. The data is presented differently under the international accounting standards, specifically IAS 19 that is applicable for the sample of UK FTSE 100 listed companies in this research [11]. It should also be noted that there is a later amended version of IAS 19 introduced in 2011 that is applicable in all accounting periods from 2013 onwards.

4.2. Empirical models

This study uses a static panel data analysis. The theoretical foundations for value relevance empirical research can be found in fundamental analysis and valuation research. Value relevance is of course concerned with equity market value, although fundamental analysis seeks to determine firms' intrinsic values [17]. The regression models are standard valuation models with a structure similar

to numerous versions used in value relevance studies by for example, Barth et al. [55], Collins et al. [56], Dechow et al. [57], Coronado and Sharpe [41], Hann et al. [34] and Coronado et al. [42] which are based on the residual income model of Ohlson [37] and the empirical valuation model developed by Feltham and Ohlson [58] as a parsimonious application of the residual income model. In the residual income model, a firm's market value is equal to its book equity value plus the present discounted value of its expected abnormal earnings. The empirical value relevance models used by for example, Coronado and Sharpe [41] and Hann et al. [34] make certain simplifying assumptions about the dynamics of abnormal earnings although the principles reflect the essence of Ohlson [37] and Feltham and Ohlson [58]. The models used in this paper contain variables that distinguish core earnings, core assets and core liabilities from pension earnings, pension assets and pension liabilities as in previous research such as that by Barth et al. [33,39], Coronado and Sharpe [41], Hann et al. [34] and Coronado et al. [42]. The analysis in this paper considers the potential direct association between the market value of equity and pension earnings, assets and liabilities – as well as the association with the core earnings, assets and liabilities (net assets). The variables in four of the five models used in this study are scaled by the number of shares as the view is taken that this mitigates scale effects more effectively than for example, book value of equity, a conclusion that is consistent with Barth and Clinch [59]. The book value of total net assets is used as the scalar in the fifth model that provides a useful comparison.

Tax analysis of defined benefit pensions is complicated and may be subject to measurement error whether the actual or 'effective tax rate' is used or the statutory tax rate is used. A number of simplifying assumptions are inevitably incorporated in all analyses in a study of this form. In a multinational corporation with permanent establishments in many different global markets, the effective tax rate is the outcome of numerous tax laws in a number of different tax jurisdictions. The effective tax rate will not necessarily be the most relevant rate to use for pension accounting adjustments to take account of the tax deductibility of pension expenses or pension fund losses. Similarly, the standard corporate income tax of the jurisdiction in which the holding company is registered will not necessarily correspond to the tax rates of the major defined benefit pension schemes. Nevertheless, in the absence of all detailed information about the nature and tax jurisdiction of all defined benefit pension schemes some assumptions must be made for the purposes of the undertaking analysis. All models used in this study adjust for tax effects using the tax rate disclosed in the IFRS (IAS 12) tax reconciliation note and based on applicable standard rates of corporate tax which is an approach that is methodologically consistent with for example, Coronado and Sharpe [41] and Hann et al. [34].

We estimated the following models. Subscript t is used to denote the time period, i denotes a firm and each of the models includes a stochastic error term ε_{it}.

$$MVES_{it} = \beta_0 + \beta_1 BVCS_{it} + \beta_2 CoreEPS_{it} + \beta_3 NPAS_{it} + \beta_4 PensionEPS_{it} + \varepsilon_{it} \quad (1)$$

$$MVES_{it} = \beta_0 + \beta_1 BVCS_{it} + \beta_2 CoreEPS_{it} + \beta_3 PAS_{it} + \beta_4 PLS_{it} + \beta_5 PensionEPS_{it} + \varepsilon_{it} \quad (2)$$

$$MVES_{it} = \beta_0 + \beta_1 TNAS_{it} + \beta_2 LTDS_{it} + \beta_3 CorebPSCEPS_{it} + \beta_4 NPAS_{it} + \beta_5 ACTGLPS_{it} + \beta_6 PSCPS_{it} + \beta_7 PIPS_{it} + \beta_8 PEPS_{it} + \varepsilon_{it} \quad (3)$$

$$MVES_{it} = \beta_0 + \beta_1 TNAS_{it} + \beta_2 LTDS_{it} + \beta_3 CorebPSCEPS_{it} + \beta_4 PAS_{it} + \beta_5 PLS_{it} + \beta_6 ACTGLPS_{it} + \beta_7 PSCPS_{it} + \beta_8 PIPS_{it} + \beta_9 PEPS_{it} + \varepsilon_{it} \quad (4)$$

$$MVETA_{it} = \beta_0 + \beta_1 BVCTA_{it} + \beta_2 ROACore_{it} + \beta_3 NPATA_{it} + \beta_4 PensionEarnTA_{it} + \varepsilon_{it} \quad (5)$$

Model 1 in Equation (1) is the 'Base Case' model used to regress the share price or market value of equity per share (*MVES*) on the core book value (meaning that all pension assets and liabilities are subtracted from the net book value of assets) per share (*BVCS*), core earnings per share (*CoreEPS*), the recognised net pension assets (or 'net pension liabilities' if a negative figure) per share (*NPAS*) and the pension earnings per share (*PensionEPS*).

The term *BVCS* for each company is derived from core book value or *BVC* which is itself derived from the book value of equity or *BVE* (calculated as total assets less total liabilities) after removing net pension assets as shown below:

$$BVC = BVE - NPA$$

Where *BVCS* is the scaled result and *NPA* is calculated as the difference between defined benefit pension scheme assets (*PA*) and defined benefit pension scheme liabilities (*PL*) as follows:

$$NPA = PA - PL$$

The core earnings per share for each company *CoreEPS* is calculated by subtracting the pension earnings per share from earnings per share as shown below:

$$\text{CoreEPS} = \text{EPS} - \text{PensionEPS}$$

This may also be expressed as:

$$EPS = \text{Core}EPS + PensionEPS$$

The splitting of earnings per share into the two components *CoreEPS* and *PensionEPS* is important to allow separate analysis of each component.

Model 2 in Equation (2) includes separate terms for the pension plan assets (*PAS*) and pension plan liabilities (*PLS*) as this recognises the extent of the pension scheme even when there is no deficit or surplus – it is expected that users of pension accounting information will be interested in the scale of the pension scheme disclosed in the financial statements.

Models 3 and 4 in Equations (3) and (4) contain the terms for total net asset value per share (*TNAS*) and the long-term debt per share (*LTDS*). *TNAS* describes data calculated after removing all pension assets and liabilities as in the case of *BVCS* that was described earlier and is before deduction of any long-term debt for each company. *TNAS* is therefore the scaled version of total net assets (*TNA*) with *NPA* removed as in the analysis of *BVC* above, and before deduction of *LTD*. Total net asset values and long-term debt are related to the single term of *BVC* as shown below:

$$BVC = TNA - LTD$$

Note: all terms are presented as positive in the models since data for LTD are negative.

Models 3 and 4 also contain the following independent variables: core earnings before pension service cost per share (*CorebPSCEPS*) and certain Defined Benefit pension components as follows: the actuarial gains and losses per share including returns on pension assets other than interest income (*ACTGLPS*); the pension service cost per share (*PSCPS*); the pension interest income on pension assets per share (*PIPS*) that is the expected return on plan assets under the pre-2011 version of IAS 19; and the pension interest expense on pension liabilities per share (*PEPS*); Model 3 includes the recognised net pension assets per share (*NPAS*) and Model 4 includes separate terms for the pension plan assets (*PAS*) and pension plan liabilities (*PLS*). It is interesting to analyse the term for pension interest expense in particular in view of the of discretion in actuarial assumptions and possible management motivation to use this discretion after the revision to IAS 19 [[2,4]].

Model 5 in Equation (5) uses total assets less net pension assets less current liabilities as the scalar in place of the number of shares so that the dependent variable is the market value of equity divided by total assets less net pension assets less current liabilities (*MVETA*) – a version of 'Tobin's Q' – and the independent variables (using the same scalar) are: core book value, as explained earlier, excluding pension plan assets and pension plan liabilities (*BVCTA*), return on assets (*ROACore*) as defined in Table 1, net pension assets (*NPATA*) and pension earnings (*PensionEarnTA*). To ensure consistency with the analysis of core earnings in the other models, the variable *ROACore* is based on core earnings. There is no term included for long term debts as this would cause econometric problems since core book value (as net book value) is broadly the difference between the scalar term and long-term debts.

A summary of definitions of all the variables used in the Models 1 to 5 is shown in Table 1 below.

4.3. Measuring actuarial gains and losses

IAS 19 (before the 2011 revision) allowed three different methods for the accounting of actuarial gains and losses in DB pension plans but the replacement standard IAS 19R changed this so that currently only one method may be used. The flexibility allowed by IAS 19 raised a potential problem of comparability but in our sample of FTSE 100 firms all but three firms used the same method, thus this potential problem was removed. The three methods of accounting for actuarial gains and losses allowed by IAS 19 were: firstly, immediate recognition in the income statement; secondly, immediate recognition in other comprehensive income (referred to in this

Table 1
Variable descriptions.

Variables	Definition/explanation
Dependent variables	
MVES	Price or market value of equity per share
MVETA	Market value of equity divided by total assets less current liabilities (used in Model 5)
Independent variables	
BVCS	Core book value per share (these exclude net pension assets – see below)
LTDS	Long term debt per share
CoreEPS	Core earnings per share (these exclude pension earnings – see below)
CorebPSCEPS	Core earnings before pension service cost per share
PAS	Recognised pension assets per share calculated as the fair market value of pension assets per share
PLS	Recognised pension liabilities per share calculated as the actuarial present value of pension liabilities per share
NPAS	Recognised net pension assets per share calculated as the difference between fair market value of pension assets and actuarial present value of pension liabilities per share
PensionEPS	Pension earnings per share
ACTGLPS	Actuarial gains and losses per share (disclosed in the term 'remeasurement' after IAS 19R)
PSCPS	Pension service cost per share
PIPS	Pension interest income per share (expected return before IAS 19R) measured as the return on pension assets excluding actuarial gains.
PEPS	Pension interest expense per share equal to the increase during a period in the present value of a DB obligation arising because the benefits are one period closer to settlement.
ROACore	Return on assets measured as core earnings divided by total assets less net pension assets, less current liabilities
BVCTA	Core book value divided by total assets less net pension assets, less current liabilities
NPATA	Recognised net pension assets calculated as the difference between fair market value of pension assets and actuarial present value of pension liabilities all divided by total assets less net pension assets, less current liabilities
PensEarnTA	Pension earnings divided by total assets less net pension assets, less current liabilities

Note: the above definitions reflect the definitions in IAS 19 and IAS 19R (the revised version of June 2011).

paper as the 'Fair Value OCI method'); and, thirdly, deferred recognition in the income statement (known as the 'Corridor Method'). The preferred method used by virtually all the firms in our sample even when it was optional, was the Fair Value OCI Method and interestingly, this is the only approach now recommended under IAS 19R. The Fair Value OCI Method is a form of fair value pension accounting that has been associated with lower value relevance than the Corridor Method (another name for 'smoothing' provisions) in research on US pension accounting (see for example, Hann et al. [34]). The choice between the Fair Value OCI Method and the Corridor Method has been a controversial topic in the USA where the choice remains. In the UK and other jurisdictions applying IFRS accounting, the Fair Value OCI Method has become mandatory. Actuarial gains and losses are also described as 'remeasurements' in the financial statements under IAS 19R – this is an overarching term and for the purposes of the analysis, includes returns on pension assets other than interest income – and they may range from very small items (when considered on a per share basis relative to stock prices) to very significant amounts in particular years. Very large actuarial gains and losses are unlikely to recur regularly for any single firm (or pension scheme) but they may be expected to have a significant financial impact on a firm especially if they cause or exacerbate a pension deficit.

5. Empirical results

5.1. Descriptive statistics

The dependent variable in Models 1 to 4 is the market value per share (*MVES*) as shown in Table 1. Descriptive statistics are presented in Table 2. The mean for *MVES* is 12.488 and there is a wide variation from 0.497 to 73.750 This is to be expected as *MVES* represents the market share price and there is a wide range of listed firms in the sample. The independent variables cover a range of balance sheet and income statement items. *BVCS* or core book value per share is the book value of the firm excluding net pension assets and has a mean of 5.456 and a wide range of values from a minimum of −2.367 to a maximum of 31.887.

The long-term debt per share (variable *LTDS*) has a mean of −3.154 and as expected there is a wide range from −30.097 to zero. *PAS* or pension assets per share has a mean of 2.439 and a considerable range from zero to 13.60. *PLS* or pension liabilities per share has a mean of −2.799 and there is a wide range from −15.965 to zero. *NPAS* or net pension assets per share may be a positive figure if the pension assets exceed the pension liabilities and may be a negative figure when the reverse is true (effectively net pension liabilities) reflecting a pension scheme 'deficit'. The variable *NPAS* has a mean of −0.361 a wide variation in amounts from a minimum of −3.275 to a maximum of 0.71.

The profit or loss figure is reflected in the term for core earnings per share (variable *CoreEPS*), this excludes pension related earnings per share and has a mean of 0.92 and as expected, a wide variation in values from −6.813 to 11.603. There is also an earnings term that adjusts for the pension service cost amount which is the core earnings before pension service cost (variable *CorebPSCEPS*) that shows a mean of 0.951 and a range from −6.812 to 11.614.

There are a number of pension terms extracted from the income statement, statement of comprehensive income and notes to the accounts. The pension earnings per share (variable *PensEPS*) has a mean of −0.035 (typically this is a net expense or loss) with a range from −2.541 to 0.852.

There are certain components from within the pension earnings per share that are identified separately and are discussed next. The pension service cost per share (variable *PSCPS*) has a mean of −0.031 and a range of values from −0.230 to 0.018 (positive figures are possible albeit rare in the case of adjustments). Variable *PIPS* is the pension income per share which is the return on pension assets (or expected return before IAS 19R) excluding actuarial gains and has a mean of 0.088 and a range of values from zero to 0.528. The pension interest expense per share (variable *PEPS*) does not include any actuarial losses and is the increase during a period (the accounting year) in the present value of a DB obligation arising because the benefits are one period closer to settlement, and has a mean of −0.101 and a range from −0.609 to zero. The actuarial gains or losses per share (variable *ACTGLPS*) has a mean of.

– 0.033 and a range from −2.707 to 0.939 a wide range that is consistent with an analysis of a significant number of DB pension schemes in the sample.

Table 2
Summary statistics for variables in Models 1 to 4.

Variable	Mean	Std.Dev.	Min	Max
MVES	12.488	11.388	0.497	73.750
BVCS	5.456	6.035	−2.367	31.887
LTDS	−3.154	3.825	−30.097	0
PAS	2.439	2.679	0	13.600
PLS	−2.799	3.084	−15.965	0
NPAS	−0.361	0.570	−3.275	0.710
CoreEPS	0.920	1.484	−6.813	11.603
PensEPS	−0.035	0.216	−2.541	0.852
CorebPSCEPS	0.951	1.495	−6.812	11.614
PSCPS	−0.031	0.036	−0.230	0.018
PIPS	0.088	0.095	0	0.528
PEPS	−0.101	0.109	−0.609	0
ACTGLPS	−0.033	0.217	−2.707	0.939

Model 5 uses total assets less net pension assets less current liabilities as the scalar in place of the number of shares so that the dependent variable is the market value of equity divided by total assets less net pension assets less current liabilities ($MVETA_t$) as explained in section 4.2 above. The summary statistics for Model 5 are shown in Table 3. *MVETA* has a mean of 1.996 and a wide range from 0.136 to 10.120 which is to be expected given the extent of firms in the sample. The first of the independent variables is core book value represented by *BVCTA* showing a mean of 0.635 with a range from −0.598 to 1.00. The long-term debt (expressed as variable *LTDTA*) has a mean of −0.365 and as expected there is a wide range from −1.598 to zero. Variable *ROACore* is the return on assets that may be expressed as a percentage or a decimal in this case with a mean of 0.132 and a range from −0.560 to 1.338. Variable *NPATA* is the recognised net pension assets calculated as the difference between the fair market value of pension assets and actuarial present value of pension liabilities (using the same scalar as the other terms in Model 5) that has a mean of −0.051, with a range from −0.657 to 0.228. Pension earnings represented by the variable *PensionEarnTA*, has a mean of −0.004 and a wide range from −0.333 to 0.276 (as shown in Table 3).

5.2. Empirical findings

All the Models 1–5 are estimated with the panel Fixed Effects (FE) estimator. Tables 4 and 5 show results. Looking at Table 4, the coefficient on variable *CoreEPS* is positive and significant (in Model 1 at $p < 0.05$, in Model 2 at $p < 0.01$). Similarly, in Models 3 and 4, the coefficients on variables *PSCPS* and *CorebPSCEPS* are positive and statistically significant ($p < 0.05$). Among other variables, coefficients on PIPS and PEPS are positive and significant ($p < 0.05$). In Model 5 (Table 5), the coefficient on variable *ROACore* is positive and highly statistically significant ($p < 0.01$).

Focusing on other independent variables, in models 3 and 4, the coefficients on variables *CorebPSCEPS* and *PSCPS, PIPS* and *PEPS* are positive and statistically significant. In Model 3, the coefficients on variables *PIPS* and *PEPS* are positive and statistically significant but the coefficient on variable *NPAS* is not statistically significant ($p < 0.05$). Finally, in Model 4, the coefficients on *PAS* and *PLS* are negative and not statistically significant ($p < 0.1$) a somewhat unusual result in that the expected sign would have been positive in each case. Another slightly surprising result is that the long-term debt measure (variable *LTDS*) that features in Models 3 and 4 has no effect on the market value. Possible explanations are that the interest rates are at historically low levels in the period under investigation while long term debt structures for major corporations such as those in the FTSE 100 have increasingly developed robust covenants that may reduce the perceived risk of gearing in the eyes of equity investors.

Value relevance is estimated by observing the statistical significance and sign of the coefficient so on that basis, it can be concluded that there is less value relevance when it comes to balance sheet figures either in the form of core book values or the pension components of PAS and PLS (mentioned earlier). This evidence is closer to the conclusions of studies such as those by Coronado and Sharpe [41] and Coronado et al. [42] that found more consistent evidence of value relevance of core earnings and pension earnings measures and these conclusions were rather different to the outcomes of much earlier research by Barth et al. [33,39].

A feature of the results is that core earnings in the form of *CoreEPS* or *CorebPSCEPS* (in Models 1 to 4) are found to be significant and value relevant. By contrast, balance sheet numbers are not found to be value relevant – whether variable *BVCS* (Models 1 to 4) or variable *BVCTA* (in Model 5). These results for balance sheet numbers and core earnings are consistent with studies, such as Onali et al. [25] that find low value relevance of book value of equity and significantly greater value relevance for earnings per share in analyses of listed companies in the UK and some other European jurisdictions. Value relevance of book values has also been found to be significantly less than for earnings per share and also varies greatly across different nations in Asia [60].

The results arising from this research suggest that pension accounting information is value relevant, but this has to be qualified by specifying that only certain components of pension earnings are found to be value relevant: pension service costs, pension interest income and pension interest expense as discussed above. A surprising result is that neither pension assets nor pension liabilities (whether expressed as an overall net figure or as separate elements) nor actuarial gains and losses (*AGTGL*) are found to have a significant impact on firm value. This is all the more surprising if changes in actuarial assumptions from one year to the next result in significant pension deficits. Crucially, in the UK pension deficits have an impact on corporate cash flow in the form of pension levies associated with the operations of Pension Regulator and the Pension Protection Fund. Overall, these results suggest less pension accounting value relevance than reported in earlier studies (all of which use US corporate data), (see Barth et al. [33,39]; Coronado et al. [42], Coronado and Sharpe [41], Daley [23], Dhaliwal [36], Gopalakrishnan [40], Hann et al. [34], Landsman [35], Werner [47]).

The results seem to be closer to those of Coronado and Sharpe [41] and Coronado et al. [42] than those of Barth et al. [33,39] in that they suggest that income statement figures are more value relevant than balance sheet figures. There is also consistency with the findings of Hann et al. [34] who find that fair-value pension accounting is less value relevant than accounting using 'smoothing' techniques. Nevertheless, the apparent lack of an association between firm value and reported pension deficits as well as actuarial

Table 3
Summary statistics for variables in Model 5.

Variable	Mean	Std.Dev.	Min	Max
MVETA	1.996	1.628	0.136	10.120
BVCTA	0.635	0.223	−0.598	1.000
ROACore	0.132	0.148	−0.560	1.338
NPATA	−0.051	0.090	−0.657	0.228
PensEarnTA	−0.004	0.041	−0.333	0.276

Table 4
Static panel analysis – Models 1 to 4.

Independent variables	Model 1	Model 2	Model 3	Model 4
BVCS	0.421* (0.235)	0.361 (0.236)		
CoreEPS	1.298** (0.515)	1.304** (0.497)		
NPAS	2.155 (2.652)		−8.280 (5.957)	
PAS		4.719 (3.147)		−2.377 (11.185)
PLS		2.874 (2.641)		−3.728 (9.641)
PensEPS	0.235 (2.234)	−2.002 (2.722)		
TNAS			0.344 (0.277)	0.355 (0.279)
LTDS			0.101 (0.447)	0.127 (0.452)
CorebPSCEPS			1.353** (0.535)	1.336** (0.528)
ACTGLPS			−1.342 (2.044)	−1.677 (2.359)
PSCPS			59.844** (27.394)	61.890** (27.194)
PIPS			344.927** (138.620)	195.600 (242.183)
PEPS			300.853** (143.605)	184.215 (219.773)
Constant	8.061*** (1.434)	4.739** (2.218)	6.467*** (2.095)	6.297*** (2.208)
No of observations	570	570	570	570
R^2	0.318	0.351	0.376	0.380

Notes: Robust standard errors in parentheses. Time fixed effects are estimated but not reported.
***p < 0.01, **p < 0.05, *p < 0.1.*

Table 5
Static panel analysis – Model 5.

Independent variables	Full sample
BVCTA	−0.250 (0.720)
ROACore	2.011*** (0.607)
NPATA	−1.444 (1.754)
PensEarnTA	3.294** (1.405)
Constant	1.830*** (0.375)
No of obs.	570
R^2	0.102

Notes: Robust standard errors in parentheses. Time fixed effects are estimated but not reported.
***p < 0.01, **p < 0.05, *p < 0.1.

gains and losses could indicate a need for future research to consider the decision usefulness of financial reporting of these complex DB pension scheme valuation issues and interpretations that are reflected in amounts disclosed in the balance sheet and income statement. Value relevance may be influenced by the applicable accounting framework ruling for example, US (FASB) and IFRS, as well as the markets in which the firm's shares are listed and as discussed earlier, market variations can be significant between countries in regions such as Europe and Asia.

6. Conclusions

This research contributes to the literature: firstly, by analysing UK listed firms that report under the IFRS accounting framework (IAS 19) rather than US listed firms that report under the US (FASB) accounting framework (used by virtually all previous pension accounting value relevance studies) and secondly, by providing evidence based on a sample of firms that used the method of immediate recognition in other comprehensive income referred to here as the 'Fair Value OCI method' – actually used by all but three companies in the FTSE 100 sample before the revision of IAS 19 and by all companies thereafter. The investigation employs some of the approaches of previous research in the literature and applies these to the UK based data in order to provide a direct comparison.

This study investigates the association between pension accounting information and firm value. A major motivation for the research is that FTSE 100 companies have very significant exposure to DB pension scheme liabilities and this is a matter of potential concern for equity investors in such companies. This reflects a wider concern in the UK where there is a persistent very large deficit across the PPF-eligible DB pension schemes – this amounted to a high of around £668 billion in 2020 and still large figure of £438 billion in 2022 on a 'full buy-out' basis [8]. Pension accounting is likely to remain challenging in the 2020s for firms sponsoring DB pension schemes in view of uncertainty in the future movement of interest rates combined with volatility in pension asset values.

The results provide evidence that pension accounting information is value relevant but in some cases is less value relevant than other types of accounting information. Core earnings are value relevant but overall pension earnings (net) are not value relevant although pension costs, pension interest expense and pension income (excluding actuarial gains and losses) have an association with firm value. Balance sheet numbers (including pension assets and pension liabilities) are less value relevant than core earnings, pension costs, pension interest expense and pension income. The lower value relevance of balance sheet numbers is consistent with research literature that analyses the value relevance of listed companies in different countries in Europe and Asia and may also reflect the

potential under-reporting of intangibles in financial statements that over time is associated with a growing gulf between book values and market values. One reason for the findings of lower pension accounting value relevance in some cases than in previous studies in the extant literature could be that many of the previous studies used data from US firms reporting under FASB rather than IFRS so the different results may be the outcome of looking at different markets operating with different accounting systems. Another possible reason is that virtually all of the firms in the FTSE 100 sample in this study applied fair value accounting for pensions (in the form of the OCI method) which has been associated with lower value relevance [34]. Net pension assets (or liabilities) and actuarial gains and losses are not found to be value relevant. Having said that there is evidence that pension costs, pension interest expense and pension income (excluding actuarial gains and losses) have an association with firm value. There is also evidence that accounting information including pension accounting information is less value relevant during the period of equity market turbulence (a feature of part of the period under review). In theory, following the logic in extant literature, pension accounting information should be value relevant if DB pensions have a potential impact on the sponsoring firm's financial position and that is reflected in the accounting numbers. Some of the findings in this article appear to depart from expectations based on the theoretical analysis for example, the surprising lack of impact of actuarial gains and losses. Long term debt as a control variable has limited value relevance and perhaps this can be interpreted as consistent with the findings for pension funding deficits since this suggests that the tolerance for reasonably large levels of long-term debt is matched by a tolerance for pension deficits. There have been historically low interest rates over the period of review, and this is consistent with expectations of tolerance for long term debt. The findings of low value relevance of certain types of pension accounting information have potentially significant implications for accounting standard setters, shareholders (existing and prospective), analysts, fund managers and researchers in accounting and finance disciplines. Firstly, the findings should be considered by accounting standard setters as possible evidence of low user confidence in the reliability of pension accounting figures and the disclosure quality since there is scope for managerial discretion and evidence of selective management of actuarial assumptions used to value pension plan liabilities in accordance with IAS 19 [2,4,52]. Secondly, the findings should be of interest especially to shareholders, analysts and fund managers who are trying to assess the sensitivity of share prices to changes in pension earnings, costs and net pension assets. Thirdly, the findings may be associated with audit quality that may weaken expected associations between pension risk and cost of equity [5].

Our study suffers from limitations that can serve as suggestions for future studies. Caution must be exercised in interpreting the statistical results due to the sample size constraint that this research confronts. In common with most of the research literature on pension accounting, this is a quantitative research study and like other value relevance research, it is concerned with the identification of associations between reported accounting numbers and firm value that implies certain behaviour by market participants. Pension accounting is a technically complex aspect of financial reporting and therefore corporate stakeholders are likely to welcome disclosure improvements, such as clearer information about discount rates and discretionary choices for certain actuarial assumptions. The relevant international accounting standard, IAS 19 was amended during the period covered by this research by a new revised IAS 19 published in June 2011 effective for annual accounting periods beginning on or after January 1, 2013 and while this study covers a period up to and including accounting year 2015 which is believed to be one of the most recent periods studied in the literature, further research is justified to build on the contributions of this study.

Future financial reporting policy could consider the effectiveness of accounting for DB pensions under the international accounting standards (IFRS) in terms of transparency and clarity for investors and other users. This paper opens the door to future research into the association between pension accounting information and firm value by considering more companies (beyond the sample of FTSE 100 companies), using the Fair Value OCI method that is now mandatory under IFRS. This research may also start a new phase of analysis of pension accounting value relevance using a dynamic approach, as used in this study to build on these research contributions and provide new evidence of overall relevance. Future research might probe deeper into and beyond value relevance towards understanding decision usefulness and its wide financial reporting policy implications.

Finally, our sample covers the period up to 2015. In the future, we plan to collect data covering the period before and after the Covid pandemic. With this extended dataset, we would be able to analyse whether the association between pension accounting information and firm value is affected (and if yes, in what way) by external shocks, such as the global pandemic.

Author contribution statement

Alan K. Kirkpatrick: Analyzed and interpreted the data; and Wrote the paper.
Dragana Radicic: Analyzed and interpreted the data; and Wrote the paper.

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