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Audit Adjustments and Public Sector Audit Quality

In the context of austerity-inspired reforms to public audit in England we investigate the extent to which audit firms mitigate management bias in public sector financial reports. A substantial body of literature finds that both public and not-for-profit managers manage 'earnings' to report small surpluses close to zero by managing deficits upwards and surpluses downwards. Under agency theory, auditors acting in the interests of their principal(s) would tend to reverse this bias. We exploit privileged access to pre-audit financial statements in the setting of the English National Health Service (NHS) to investigate the impact of audit adjustments on the pre-audit financial statements of English NHS Foundation Trusts over the period 2010–2011 to 2014–2015. We find evidence that auditors act to reverse management bias in the case of Trusts with a pre-audit deficit, but find no evidence that this is the case for Trusts with a pre-audit surplus. In the case of Trusts in surplus, these findings are consistent with auditors' interests being aligned with management, rather than principals.

Key words: Agency; Audit adjustments; Audit quality; Earnings management; Financial reporting quality; Public sector.

In December 2015 the English National Health Service (NHS), in the context of austerity-inspired cuts in public spending, was in danger of incurring a deficit of £2bn. The sector regulator issued guidance to all NHS bodies requesting that, *inter alia*, they 'remove prudence from estimates of accruals' (Monitor/Trust Development Authority, 2016). This review released over half a billion pounds to the NHS consolidated income statement (NHS Improvement, 2016) raising questions about the quality of the audit function (House of Commons, 2016).

There is considerable evidence that public sector managers manage their financial statements to meet financial objectives (see, for example, Vermeer *et al*., 2014; Ballantine *et al*., 2007). The climate of austerity and uncertainties about future funding enhance the incentives for such 'earnings' management at a time when the public, and their representatives in Parliament, are increasingly dependent, especially for the purposes of resource allocation, on a high quality public audit service to mitigate management bias in financial reporting.

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Although a large literature exists on audit quality in the private sector (Francis, 2004) the lessons from this research cannot be assumed to apply equally to the public sector where there are differences in both the institutional and incentive frameworks that affect both managers and auditors. Prior empirical studies on public sector audit quality are, however, limited and are concentrated in North America, particularly US municipalities (Copley, 1991; Deis and Giroux, 1992; McLelland and Giroux, 2000; Cohen and Leventis, 2013). The focus of these papers has largely been on the determinants of audit quality rather than on the question as to whether auditors mitigate management bias in reporting. We contribute to the literature by investigating this question in the context of English National Health Service Foundation Trusts. We further contribute to the literature by utilizing a direct measure of audit outcomes, in the form of audit adjustments to the reported surplus/deficit, in contrast to other studies that utilize indirect measures of financial reporting quality (Ballantine *et al.*, 2008). This direct measure of audit outcomes has been facilitated by access to pre-audit financial statements for the period 2010–2011 to 2014–2015.

We find that, overall, audit adjustments result in a reduction in reported financial performance, reducing surpluses and increasing deficits. This is consistent with prior evidence of auditor conservatism in the private sector (see, for example, Lennox *et al.*, 2016, 2018) but, in the public sector, is consistent only with the reduction of management bias for entities in deficit. For entities in surplus, there is considerable evidence that 'earnings' are managed downwards and so downward audit adjustments arguably increase rather than decrease management bias. We further find that the probability of an audit adjustment that reverses management bias, as opposed to one that does not, is higher in Trusts with a pre-managed deficit. There is no such relationship in Trusts with a pre-managed surplus.

PRIOR LITERATURE

Public sector studies of the determinants of audit quality find that it increases with industry specialization (Deis and Giroux, 1992; McLelland and Giroux, 2000) and decreases with the size and financial wealth of the client (Deis and Giroux, 1992; McLelland and Giroux, 2000; Lowensohn and Reck, 2004). Auditor size and reputation, however, have little impact (Copley, 1991; McClelland and Giroux, 2000; Ballantine *et al.*, 2008). Elsewhere, Cohen and Leventis (2013) find that, in Greek local authorities, the timeliness of audit reporting is influenced by political factors such as the strength of opposition parties, the incidence of mayoral change, and the proportion of governmental grants. To date there has been little research, in either the private or public sectors, investigating whether auditors act to mitigate management bias in financial reporting. Two recent papers, however, address this issue in the private sector.

Lennox *et al.* (2016) exploit access to pre-audit financial information from the Ministry of Finance in China,[1] to investigate the impact of audit adjustments on

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[1] Since 2006, Chinese audit firms have been required, for their publicly traded clients, to provide the Ministry of Finance with the pre-audit and audited values of pre-tax earnings and total assets.

earnings quality. Analysis of their sample of 11,486 observations reveals that the incidence of downward audit adjustments is much higher than upward audit adjustments. Although this is consistent with auditor conservatism, earnings quality is not impaired. Rather, it mitigates management's tendency for upward earnings management, leading to better quality earnings overall. Based on the same data set, Lennox *et al.* (2018) additionally find that auditors help to improve financial reporting quality before stock-financed acquisitions by requiring downward adjustments to pre-audit earnings. The generalizability of these results is, however, restricted by the very distinctive features of Chinese capital markets, including the role of the state.

Elsewhere in the private sector, however, similar results are found for the direction of audit adjustments (Hylas and Ashton, 1982; Kreutzfeldt and Wallace, 1986; Kinney and McDaniel, 1989; Wright and Wright, 1997). Two public sector studies also find that audit adjustments have a downward tendency (Grein and Tate, 2011; Baylis and Greenwood, 2016).

Historically, the study of audit adjustments has been constrained by data access issues, especially in the private sector where there are issues of client and auditor confidentiality. Research has, therefore, tended to focus on the outputs of a review of auditor working papers where samples are, inevitably, small (Deis and Giroux, 1992, 1996; Giroux and Jones, 2011).

We contribute to this limited literature as follows. First, we investigate whether audit adjustments mitigate management bias in the reporting of surpluses/deficits in the public sector, a setting where both auditor and management incentives differ from those in the private sector. Second, in contrast to the majority of audit quality studies that use indirect measures of audit quality, we exploit access to pre-audit financial statements to derive a direct measure of audit quality: the incidence and direction of audit adjustments.

INSTITUTIONAL AND REGULATORY SETTING

NHS Foundation Trusts were established from 2004–2005 as the preferred model of healthcare service delivery in England (Health and Social Care (Community Health and Standards) Act 2003). Their establishment represented an innovation in a reform programme dating back to the 1980s in which public services became disaggregated into self-governing corporatized units and in which private sector management styles and governance structures were, and continue to be, introduced as models of best practice (Hood 1991, 1995; Lapsley, 2008; Hyndman and Lapsley, 2016) even though the expected outcomes may not subsequently be realized (Lapsley, 2009).

Foundation Trusts were granted unprecedented levels of managerial freedom, including the ability to retain funds and to borrow on commercial markets for the purposes of strategic service development. Although publicly funded, receiving most of their capital in the form of 'taxpayers' equity', and revenues in the form of contracted payments for patient treatments, they are free from central government control, reporting directly to Parliament and regulated by an independent

regulator, Monitor.[2] As at the end of 2014–2015 there were 153 Foundation Trusts in existence delivering £37bn of health services (approximately 30% of total English NHS expenditure) to local communities (NHS England, 2015, p. 148).

Foundation Trusts have a dual tier governance structure with a Governing Body comprising non-remunerated representatives of key stakeholder groups providing oversight of the remunerated main Board. The main Board is responsible for the management and performance of the Trust. Key stakeholders on the Governing Body include representatives of service commissioners and of local authorities (National Health Service Act, 2006). These bodies have a particular interest in the financial performance of the Trust as they engage in contractual negotiations for the volume, quality, and price paid for the Trust's services (Monitor, 2013, p. 71).[3] The Governing Body has a number of key powers, including the power to appoint the Trust Chairman, to appoint the auditors, and to receive the financial statements and the report of the auditors in general meeting (National Health Service Act, 2006). Each Trust is required to establish an audit committee of at least three independent non-executive directors, one of whom should have recent relevant financial experience, to monitor and review the audit function and to advise the Governing Body (Monitor, 2010/2014). Until 1 April 2013, a Foundation Trust Governing Body was statutorily required to include representatives of service commissioners (Health and Social Care Act, 2012).

The main responsibilities of Foundation Trust auditors go beyond those applicable to the private sector. These responsibilities are set out in the National Health Service Act, 2006, Sch 10. In addition to complying with all other legal and regulatory requirements that apply to them, Foundation Trust auditors must satisfy themselves that the financial statements are prepared in accordance with the requirements of Monitor in its Foundation Trust Annual Reporting Manual[4] (as approved by the Treasury) and that the Trust has made proper arrangements for securing economy, efficiency, and effectiveness in its use of resources. Further, auditors are required to consider whether they should issue a report on any matter arising in the course of the audit that they believe is of public interest and should be brought to the attention of the public (a public interest report).

The audit of Foundation Trusts is regulated by the National Health Service Act, 2006, Sch. 7. The Governing Body has the statutory power to appoint an auditor

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[2] From April 2016 Monitor became a part of NHS Improvement, a non-departmental body that has assumed responsibility for ensuring that Monitor's statutory functions are performed.

[3] 'Commissioners specify in detail the delivery and performance requirements of providers such as NHS Foundation Trusts, and the responsibilities of each party, through legally binding contracts. NHS Foundation Trusts are required to meet their obligations to commissioners under their contracts. Any disputes about contract performance should be resolved in discussion between commissioners and NHS Foundation Trusts, or through their dispute resolution procedures' (Monitor, 2013, p. 71).

[4] The latest version of the FT annual reporting manual can be found here: https://improvement.nhs.uk/resources/nhs-foundation-trust-annual-reporting-manual-201718/

from any of the bodies listed under paragraph 23(4).[5] The auditor then performs his/her audit work in accordance with the Audit Code issued by Monitor (2011a, 2014).[6] Regulation of Foundation Trust auditors, including quality assurance, is performed by the Financial Reporting Council (the regulator of private sector auditors), and is overseen by Monitor, the Foundation Trust regulator. This regime pre-dated the new system of public audit regulation and the abolition of the Audit Commission[7] (Local Audit and Accountability Act, 2014).

THEORETICAL FRAMEWORK

Agency theory predicts audit as a means of reducing agency costs (Jensen and Meckling, 1976; Watts and Zimmerman, 1983) and of mitigating the possibility of self-serving reporting by management (Sunder, 1999), for which a significant body of evidence exists in all of the private, not-for-profit and public sectors. In the public sector, despite a weaker incentive framework than in the private sector, there is considerable evidence that surpluses are managed downwards and deficits upwards in order to report small surpluses close to zero (Hoerger, 1991; Leone and Van Horn, 2005; Ballantine *et al.*, 2007; Greenwood et al., 2017). This has been particularly so since the introduction of accrual accounting (Barton, 2009), which has increased the opportunities for earnings management at a time when the incentive framework has been strengthening due to new public management-inspired reforms (Hood, 1991, 1995; Lapsley, 2008). Indeed, evidence suggests that the management of accruals in the public sector is more aggressive than in the private sector (Vermeer *et al.*, 2014). If auditors act to reduce agency costs then we expect that they would negotiate adjustments to the financial statements to mitigate this bias. However, auditors are also agents in their own right and face their own incentives, most notably the profit motive, the threat of litigation, and the potential for loss of reputation (De Angelo, 1981; Antle, 1982, 1984; Francis, 2004; ICAEW, 2005; Francis, 2011). As rational self-

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[5] Potential auditors compete for each NHS Foundation Trust audit contract. This contrasts with the NHS Trust regime which, until 2015, remained under the regulation of the Audit Commission (Ellwood and Garcia-Lacalle, 2015; Greenwood and Tao, 2017). Under the Audit Commission regime, auditors were appointed by the Audit Commission with competition between audit firms for blocks of audit fees covering a number of Trusts. The individual Trust was then notified of its audit fee by the Audit Commission based on a scale of fees that covered the cost of operating the Commission as well as the contracted payments to audit firms. Since their inception, Foundation Trusts, whose Governing Bodies appoint the auditor, have notably experienced much lower audit fees than NHS Trusts (Greenwood and Tao, 2017).

[6] From 1 April 2015 Monitor's Audit Code has been superseded by the National Audit Office's Code of Audit practice. https://www.gov.uk/government/publications/nhs-foundation-trusts-audit-code.

[7] The Audit Commission was established as an independent body in 1983. Its primary remit was the audit of local public bodies. Its role encompassed the provision of audit services, whether sourced from their own in-house audit practice or sub-contracted to private sector firms, the setting of audit fees for each individual local body, and the monitoring of audit quality.

interested agents, auditors may therefore act in their own self-interest rather than in the interests of principals. However, there are distinct differences between the incentives faced by auditors of public sector organizations as compared with auditors of the private sector.

In the private sector the potential for litigation and loss of reputation incentivizes auditors to deliver a high quality audit (Francis and Wilson, 1988; Kothari *et al.*, 1988; Francis, 2004, 2011; DeFond and Zhang, 2014). In the public sector, however, the threat of litigation is minimal, as governments stand behind public sector entities, reducing the risk of financial failure. The risk of reputation loss is also lower but the impact, should it occur, could be much greater (Copley, 1989; Clatworthy *et al.*, 2002) because of the much greater public exposure. Thus, in the public sector (as in the private sector) auditors have incentives to mitigate the upward management of deficits, (which might disguise an underlying fragile financial position), but do not experience similar incentives to negotiate adjustments that mitigate the downward management of surpluses. In this scenario, auditor incentives to argue for an increase in the reported surplus are weak: the additional effort in building and negotiating a case for an adjustment may not be recovered in additional fees[8] and management resistance to an upward adjustment could be expected to be high – small surpluses signal competence in resource utilization and, when facilitated by managerial discretion in reporting, help to protect against future revenue reductions and cost pressures (Ballantine *et al.,* 2007, Pilcher and Van der Zahn, 2010). Managers, however, may be less resistant to an audit adjustment, which reduces (rather than increases) the reported surplus, as, for example, in a cut off error.

A limited review of unadjusted audit differences as reported under ISA 260 has revealed potential evidence in support of this analysis. For example, in 2015–2016 South Derbyshire Clinical Commissioning Group (CCG) accepted adjustments of £1m, which had no impact 'on the bottom line position',[9] to each of payables and receivables. The CCG did not, however, agree to an adjustment arising from a late credit note from Derby Hospitals Foundation Trust. This resulted in an overstatement of expenditure of £2.7m at a time when the Group was within £9m of its expenditure limit of £734m. This essentially transferred £2.7m from 2015–2016 to future periods when, under austerity-induced public spending cuts, it might prove more useful.

In summary, auditors face incentives to reduce management bias for entities in deficit but face much weaker incentives to do this for entities in surplus.

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[8] This is in contrast with the previous Audit Commission regime where an auditor could apply to the Audit Commission for an increase in fee (Audit Commission Act 1998, Ch 18, s.7; Audit Commission 2014) and if agreed, would be put into effect, either through an increase in the current year fee or through future year's fees.

[9] ISA 260 report for 2015–2016 for South Derbyshire Clinical Commissioning Group.

METHOD

In this paper we use privileged access to pre-audit financial statements to investigate whether, in the public sector, audit adjustments reduce management bias in the reporting of surpluses/deficits.

We thus use audit adjustments as a proxy for audit quality. Many other, mostly private sector, studies have used measures of earnings quality as a proxy for audit quality. However, in addition to the auditor's influence, audited earnings are affected by the reporting choices of managers, by non-discretionary factors and by real earnings management and are therefore imprecise measures of audit outcomes (Defond and Zhang, 2014; Lennox *et al.*, 2016). Audit adjustments represent a more direct measure of audit outcomes and are identified by comparing the pre-audit and post-audit surplus/deficit.

However, although this measure has been used in private sector studies (Francis, 2004; Lennox *et al.*, 2016; Lennox *et al.*, 2018) in public sector studies there is often insufficient data. Our own data base is large in comparison with other public sector studies such as those reported in Kinney and Martin (1994) but is still relatively modest in size. In this paper, we therefore adopt an exploratory approach using both descriptive and multivariate analysis. We first examine the distribution and direction of audit adjustments that impact the reported surplus/deficit. Then, given that research evidence shows that surpluses tend to be managed downwards and deficits upwards, we investigate the direction of audit adjustments for surplus and deficit observations. We then proceed to refine this analysis by using an estimate of discretionary accruals as a proxy for trust-year managerial discretion in financial reporting and investigate the incidence and scale of audit adjustments in the presence of discretionary accruals that increase (decrease) the reported surplus (deficit). Consistent with our theoretical analysis, which suggests that the impact of audit may vary with pre-audit financial performance, we separately consider Trusts that have pre-audit deficits on the one hand, and pre-audit surpluses on the other.

Finally, we proceed to multivariate analysis and, using a probit regression, test whether there is a higher probability of an audit adjustment that reverses management bias than one which does not – see equation (1).

$$AA_{it} = \beta_0 + \beta_1 DA_{it} + \beta_2 AUDFEE_{it} + \beta_3 Auditor_{it} + \beta_4 lnSIZE_{it} + \beta_5 FTtype_{it} + \beta_6 liq_{it}$$

$$+ Year \qquad\qquad (1)$$

Where: *AA* takes the value of 1 in the presence of a downward audit adjustment, 0 in the presence of an upward audit adjustment. As our research question directly focuses on whether audit adjustments reduce management bias we exclude observations without an audit adjustment.[10] *DA* takes the value of 1 in

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[10] An analysis of observations with no audit adjustments (untabulated) shows that discretionary accruals, whether positive or negative, are not significantly different from zero. Further there is no difference in the percentage of observations without an audit adjustment when analyzed between Trusts with a pre-managed deficit and a pre-managed surplus.

the presence of income-increasing discretionary accruals, 0 otherwise. An audit adjustment reduces management bias when AA = 1 (downward) and DA = 1 (discretionary accruals are positive), and when AA = 0 (upward) and DA = 0 (discretionary accruals are negative). *AUDFEE* is the natural log of the statutory audit fee; *Auditor* is a categorical variable indicating auditor identity as between the Audit Commission,[11] Big 4 audit firms, and second-tier audit firms. *Auditor* has been separated into two dummy variables (Audit Commission and second-tier), with Big 4 as the base case; *lnSIZE* is the natural log value of total assets; *FTtype* is a categorical variable identifying the type of Trust (acute, mental health, and other). It has been separated into two dummy variables (mental health trusts and other trusts), with acute trusts as base case; *liq* is a measure of short term liquidity (current assets/current liabilities) and Year is an indicator variable to accommodate yearly variations for example in auditor reporting requirements.

This probit regression tests whether the probability of an audit adjustment which reduces management bias is higher than the probability of an audit adjustment which does not. A positive coefficient before DA suggests that when discretionary accruals are income-increasing (DA = 1) the probability of a downward audit adjustment (AA = 1) is higher than for an upward adjustment (AA = 0). Likewise, when discretionary accruals are income-decreasing (DA = 0) the probability of an upward adjustment (AA = 0) is higher than a downward adjustment (AA = 1).

Control Variables

The auditor-related controls are audit fee (*AUDFEE*) and auditor size (*Auditor*). The audit fee, by measuring auditors' effort level (Gul, 2006; Lobo and Zhao, 2013; Hribar *et al.*, 2014) and the reputation/litigation effect (Craswell *et al.*, 1995; Simunic and Stein, 1996) has generally been taken as a proxy for audit quality in both public and private sectors (Francis, 2004; Mellett *et al.*, 2007; Ballantine *et al.*, 2008; Giroux and Jones, 2011; Ellwood and Garcia-Lacalle, 2015). Others, however, have questioned the merits of using the audit fee as a measure of quality (DeFond and Zhang, 2014). In this paper our measure of audit quality is the incidence of audit adjustments. We use audit fees as a control to ascertain whether the incidence of an audit adjustment varies with the audit fee.

The reputation hypothesis posits that large audit firms have incentives to maintain service quality to preserve their reputations (DeAngelo, 1981). Choi *et al.* (2010) and Sundgren and Svanström (2013) further propose that larger audit firms and offices offer auditors more training activities and a better internal review system of audit work. Conventionally auditor size has been proxied by the Big N variable (Becker *et al.*, 1998; Francis *et al.*, 1999; Francis, 2004; Behn *et al.*, 2008). Following prior public sector literature (Clatworthy *et al.*, 2002; Giroux and Jones, 2007; Ballantine *et al.*, 2008; Ellwood and Garcia-Lacalle, 2015), this study

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[11] The Audit Commission, the former regulator of local public audit in England, with its own audit practice, conducted no Foundation Trust audits from 2013/14 following the transfer of its audit practice to private sector firms.

allocates auditor type into three categories: Big 4 firms (1), second-tier audit firms (2) and the Audit Practice of the Audit Commission (3). We use Big 4 firms as the base group against which the marginal impact of audit firm type, (second tier and Audit Commission) is estimated (Wooldridge, 2016, pp. 212-214). When an audit adjustment is upward (AA = 1), a positive coefficient on *Auditor* would indicate that, compared with the Big 4, an audit firm category is more likely to have a downward adjustment.

There has been some evidence that audit quality varies by the type of Trust (Greenwood and Tao, 2017), perhaps because audit firms regard the FT market as largely homogeneous. We therefore include both Trust size (*SIZE*) and Trust type (*FTtype*) as proxies for audit complexity. Trust types are: acute hospital trusts (1), mental health trusts (2), and other trusts (3). We adopt acute firms as our base group and estimate the marginal impact of mental health and other Trusts. Liquidity (*liq*) is included as a proxy for audit risk. Liquidity is subject to regulatory monitoring (Monitor 2009, 2011, 2013) and has the potential to be associated with the exercise of managerial discretion (Greenwood *et al.*, 2017) and thus on the potential for audit adjustments.

In a literature review, primarily of capital markets research, Armstrong *et al.* (2010) identify numerous other variables hypothesized to be associated with audit quality. Of these, governance and audit committee characteristics, such as board structure, proportion of outside directors, and expert directors, are potentially relevant in a public sector context. However, in the Foundation Trust environment, governance arrangements, including the composition, responsibilities, and reporting requirements of the audit committee, are subject to considerable regulation (Monitor, 2014). In a relatively small sample this results in insufficient variation from year to year and between Trusts to facilitate the detection of significant influences. Such variables have therefore been omitted from our model.

Sample and Data

Post-audit data was obtained from the Laing and Buisson Database of NHS Financial Statements, whilst the pre-audit data, which is restricted to the five fiscal years of 2011–2015, was accessed under special licence from Monitor, the Foundation Trust regulator. During the sample period the number of Foundation Trusts increased from 136 to 153, giving a total of 721 potential trust-year observations. Our sample is reduced to 568 observations as a result of three missing observations and as a consequence of lagging in the estimation of discretionary accruals.

Accruals Modelling

To identify management bias we apply the Modified Jones Model (Dechow *et al.*, 1995) to estimate discretionary accruals as follows:

$$\frac{TAcc_{it}}{TA_{it-1}} = \alpha_1 + \alpha_2 \frac{\Delta(Rev - Rec)_{it}}{TA_{it-1}} + \alpha_3 \frac{PPE_{it}}{TA_{it-1}} + \varepsilon_{it} \qquad (2)$$

Where: $TAcc_{it}$ is calculated for entity i, from time t–1 to t, as the change in current assets minus the change in current liabilities minus the change in cash and cash equivalents, plus the change in short-term borrowing, minus the change in long-term provisions and minus depreciation and amortization; $\Delta(Rev - Rec)_{it}$ is the change in the difference between revenue and receivables from time t–1 to t; PPE_{it} is the level of property, plant and equipment at time t for entity i. ε_{it} is the residual representing our measure of discretionary accruals. All variables, except the constant, are scaled by lagged total assets (Jones, 1991; Ballantine *et al.*, 2007). Consistent with Peasnell *et al.* (2000) the constant term is unscaled.[12] This facilitates the use of a fixed effects panel estimator as indicated by the results of a Hausman test (Hausman, 1978).

In Foundation Trusts the use of long term provisions as a means of managing 'earnings' is beneficial as adjustments to long term provisions do not affect measures of short term liquidity. A low liquidity ratio increases the risk of intervention by the sector regulator, Monitor (Monitor, 2009, 2011b, 2013). Intervention ranges from additional monitoring to replacement of the Governing Body and Board.

In the estimation of discretionary accruals equation (2) recognizes that accruals are a function of revenue growth, which when adjusted for receivables allows for non-discretionary growth in credit sales, and that depreciation is a function of PPE (Dechow *et al.*, 2010). Both these are relevant in the context of Foundation Trusts where the fixed asset base is substantial, and where revenue is largely generated from a payment by results contract with commissioners.

Pragmatically, however, the modified Jones model (Dechow *et al.*, 1995) has been selected as the preferred estimator of discretionary accruals because of the restricted data base—limited in total to five years observations. Lagging in the Jones model results in the loss of only one year's observations whilst use of the Dechow and Dichev model (Ballantine *et al.*, 2007, 2008) results in a loss of two years' observations. Further, the modified Jones model is considered better at distinguishing between innate and discretionary sources of variation in accruals (Francis, *et al.*, 2006). There has, however, been some criticism that its explanatory power is low (Dechow *et al.* 2010) and that the variables designed to control for innate factors (ΔRev and PPE), do not adequately capture the financial reporting effects of business fundamentals as opposed to the exercise of managerial

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[12] Where the intercept is scaled by total assets, the resulting regression is estimated with the true constant term suppressed. This is not possible with a panel data estimator. There is no theoretical reason for forcing the regression through the origin and regressions estimated with the constant suppressed preclude an analysis of the goodness-of-fit of the models because the associated R-square values are unreliable (Peasnell *et al.*, 2000). However, as a test of the robustness of our results, we repeat our estimation of discretionary accruals with an OLS estimator using a scaled constant and with the true constant suppressed and repeat our analysis. The results are reported in our findings.

discretion (Francis *et al.,* 2006). In the setting of NHS Foundation Trusts, however, there is little variation in either the business model or the operating environment.

FINDINGS

Descriptive Statistics and Univariate Analysis

Table 1 Panel A provides descriptive statistics based on the post-audit financial statements of the NHS Foundation Trusts in our sample. It shows that over the period of our study, Foundation Trusts had a mean income of £268m, ranging from £11m for the smallest and £1.3bn for the largest. Expenditure figures are similar whilst total assets are slightly lower with a mean of £207m. The mean deficit is £922k but, consistent with a median surplus of £678k, is skewed by a few large deficits (Figure 1). The remaining figures in Table 1 illustrate the potential for the exercise of discretion in reported earnings. It is often argued that in public sector organizations this potential is low. Foundation Trusts receive most of their income from public sources and intra-NHS balances are reconciled, so this leaves little potential for the exercise of discretion, although there is still some scope for misstatements which are not material[13] and which are not adjusted in the audit process.[14] There is, however, scope for the management of reported figures through payables (mean £28m) and the various provisions figures: bad debts, short term provisions, and long term provisions, each have a mean value of approximately £2m.

Panel B shows that as a percentage of revenue and of assets, our sample has a mean deficit of approximately 0.5% with a median surplus also of approximately 0.5%. The distribution is negatively skewed and has high kurtosis. These figures are consistent with the reporting of small surpluses close to zero (Figure 1). Table 1 Panel C shows audit adjustments by type of Trust and auditor. Big 4 auditors have a higher percentage of adjustments (33%) than the Audit Commission or second tier auditors (all others). The highest percentage of audit adjustments occurs in mental health trusts.

Table 2 reports the incidence (Panel A) and value (Panel B) of audit adjustments. Panel A shows that the incidence of adjustments is highest for the surplus/deficit, receivables, and payables figures, with over 30% of Trusts having an adjustment to these figures.

The biggest value adjustments (Panel B) occur in the surplus/deficit figure both in terms of magnitude (mean £141k) and relative to the pre-audit value. The mean of the latter is –10% giving the first indication that audit adjustments tend to move reported financial performance downwards, whilst the mean of the absolute value of adjustments (24% of the pre-audit value), indicates their scale. The next most

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[13] For a Trust with mean assets the materiality level would be set in the region of £2–4m (ISA 320, para A8 (Financial Reporting Council, 2016).

[14] An example of such an unadjusted error has been noted in an ISA 260 document of an NHS organization indicating that management of the revenue figure is possible.

DESCRIPTIVE STATISTICS—POST-AUDIT FINANCIAL STATEMENTS 2010–2015

Panel A: Descriptive statistics for main financial accounts

Post-audit variables	Obs.	Mean	Sd.	Min	Max	Median	Skewness	Kurtosis
		£000	£000	£000	£000	£000		
Total income	721	268,032	189.079	10,583	1,289.856	223,958	2.14	8.92
Total expenditure	721	264,168	184,039	10,352	1,238,579	223,486	2.06	8.56
Total assets	721	206,691	165,469	9,492	1,472,648	161,808	2.87	15.45
Earnings (Surp/Def)	721	-922	18,793	-249,654	181,012	678	-3.34	72.26
Receivable	721	14,153	15,445	867	128,261	9,865	3.37	17.95
Payables	721	27,770	22,807	1,580	164,095	21,194	2.61	11.64
Inventory	721	3,225	3,703	0	20,760	2,349	1.91	7.17
Depreciation	721	7,267	5,824	179	40,139	5,566	2.12	8.91
Long term provision	721	1,908	2,402	0	20,368	1,091	3.22	18.56
Short term provision	721	2,056	3,148	0	54,729	1,005	7.63	113.00
Bad debt provision	721	1,645	3,991	0	50,228	619	6.93	63.86

Panel B: Descriptive statistics for the income and expenditure account

| Post-audit value	Obs.	Mean	Sd.	Min	Max	Median	Skewness	Kurtosis
Surplus/deficit scaled by total revenue	721	-0.005	0.059	-0.748	0.251	0.004	-5.062	54.769
Surplus/deficit scaled by total assets	721	-0.006	0.067	-0.522	0.327	0.005	-2.353	20.151

Panel C: Distribution of audit adjustments by Foundation Trust type and by auditor

FT type	No. of obs.	Percent (%)	No. with audit adjustments	Percent with audit adjustments (%)
Acute	405	56.2	119	29.4
Mental	206	28.6	77	37.4
Other	110	15.3	31	28.2
Total	721	100.0	227	31.5
Auditor				
Big 4	557	77.3	184	33.0
Second tier	93	12.9	24	25.8
Audit Commission	71	9.9	19	26.8
Total	721	100.0	227	31.5

significant adjustments are, as predicted, those to payables (mean £104k). These adjustments represent a much lower percentage of the pre-audit value.

To investigate further the direction of adjustments Table 3 shows the incidence and magnitude of adjustments, split between downward adjustments and upward adjustments in the surplus/deficit figure. Panel A shows that there are 137 downward adjustments compared with 90 upward adjustments. Panel B further shows that the value of downward adjustments (mean value £1,687k) also exceeds the value of upward adjustments (£1,441k) and that this is also reflected when the adjustments are scaled both by revenue and by the pre-audit value. Thus

HISTOGRAM OF REPORTED EARNINGS FOR NHS FOUNDATION
TRUSTS FROM 2011 TO 2015
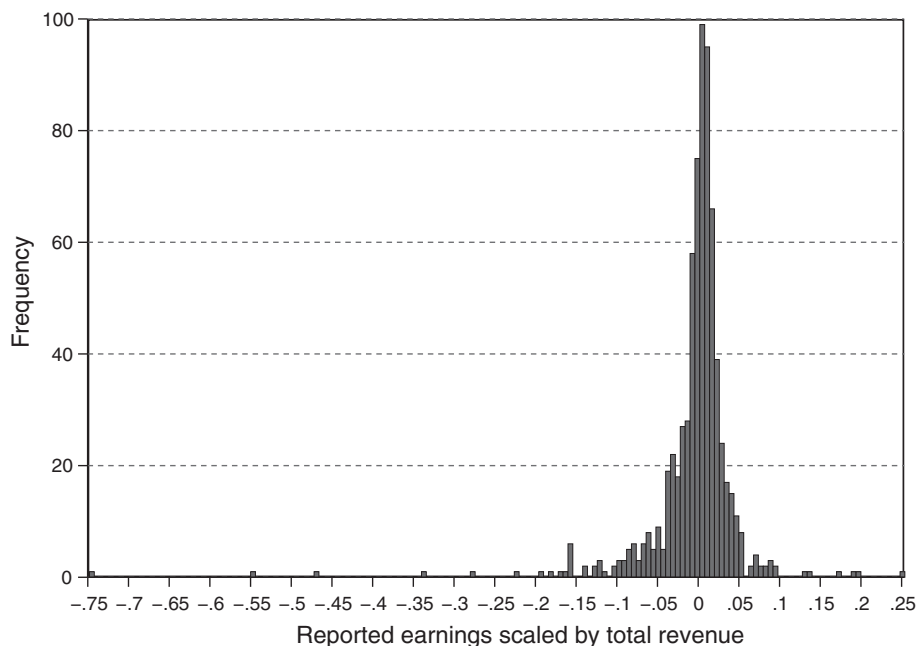
Note: The distribution of reported earnings scaled by total revenue for NHS Foundation Trusts from year 2011 to 2015. The distribution bin widths are 0.006 (Degeorge *et al.*, 1999): calculated as $2(IQR)*(N^{-1/3})$, where IQR is the sample interquartile range and N is observation number. Frequency is the number of observations in a given interval.

a pattern is emerging that downward adjustments are both more prevalent and higher in value than upward adjustments.

In Table 4 we investigate further the direction of audit adjustments for Trusts with pre-audit deficits and those with pre-audit surpluses. Panel A shows that the incidence of downward adjustments significantly (z-test) exceeds the incidence of upward adjustments for both deficit and surplus observations. Interestingly this phenomenon is much more pronounced for surplus observations where we might expect audit adjustments to have an upward bias.

Panel B shows the scale of upward and downward adjustments for pre-audit surplus and deficit observations. For surplus observations there is no difference between the scale of upward and downward adjustments (mean 0.4%, median 0.1%). Relative to pre-audit earnings, however, the scale of upward adjustments for surplus observations, (65%) is significantly lower than the downward adjustments (104%) ($p = 0.05$). This is also true for deficit observations (34% vs 63%). These results are consistent with auditors reducing management bias for

INCIDENCE AND VALUE OF AUDIT ADJUSTMENTS

Panel A: Incidence of audit adjustments

Accounts	Observations with adjustments		
	No. of obs.	% total obs.	Total obs.
Earnings (Surp/Def)	227	32	721
Receivable	229	32	721
Payable	274	38	721
Inventory	27	4	721
Depreciation	45	6	721
Long term provision	75	10	721
Short term provision	101	14	721
Bad debt provision	46	6	721

Panel B: Mean value of audit adjustments

	Unscaled adjustments[a] (£000)	Relative adjustments[b]	Absolute relative adjustments[c]
Earnings (Surp/Def)	−140.78	−10.47%	23.73%
Receivable	−59.00	−0.21%	2.05%
Payable	−103.66	−0.26%	1.42%
Inventory	−4.23	−0.16%	0.28%
Depreciation	0.51	0.02%	0.18%
Long term provision	−7.50	0.84%	2.76%
Short term provision	−6.68	17.08%	20.92%
Bad debt provision	−8.96	2.75%	3.89%

Notes:
[a]Unscaled adjustments = mean value of (post-audit minus pre-audit values)
[b]Relative adjustments = mean value of (unscaled adjustment divided by pre-audit value);
[c]Absolute relative adjustments = mean value of (absolute unscaled adjustment divided by pre-audit value).

deficit observations but not for surplus observations. Rather, for surplus observations the auditor adjustments appear to reinforce the direction of management bias.

Further insight into the direction of adjustments is given by the quintile analysis shown in Table 5, which shows the direction of adjustments for each quintile of pre-audit earnings (Quintile 1 represents the biggest surpluses and Quintile 5 represents the biggest deficits). Panel A shows that, with the exception of small deficits (Quintile 4) the number of downward adjustments exceeds the number of upward adjustments. Interestingly, for the highest surplus observations (Quintile 1), 19.44% have downward adjustments compared with only 11.81% with upward adjustments. These are the observations where we would expect the highest downward management of earnings and where we might, therefore, expect the audit adjustments to be more upward than downward. This finding does, however, offer an explanation for the findings of Greenwood *et al.* (2017) where, in an analysis of published financial statements, a higher than expected level of

TABLE 3

INCIDENCE AND MAGNITUDE OF UPWARD AND DOWNWARD ADJUSTMENTS TO
EARNINGS (SURPLUS/DEFICIT)

Panel A: Number and percentage of adjustments

	Upward adjustments		Downward adjustments		Total adjustments		Total obs.
	No. of obs.	%	No. of obs.	%	No. of obs.	%	
Surplus/deficit	90	12%	137	19%	227	31%	721

Panel B: Magnitude of upward and downward adjustments to earnings

	Upward adjustments			Downward adjustments		
	Mean	Median	Max	Mean	Median	Max
Unsealed adjustments[a] (£000)	1,441	128	54,660	1,687	148	37,513
Scaled adjustments[b] (%)	0.4	0.1	6.8	0.7	0.1	14.2
Relative adjustments[c] (%)	53.1	7.0	1,161.9	90.0	3.6	5,079.3

Notes:
[a] Unscaled audit adjustments = post-audit earnings – pre-audit earnings;
[b] Scaled adjustments = (post-audit earnings – pre-audit earnings)/pre-audit total revenue;
[c] Relative adjustments = |post-audit earnings – pre-audit earnings|/|pre-audit earnings|.

downwards earnings management was found for Foundation Trusts with high levels of pre-managed surplus. The highest incidence of downward adjustments, as expected, occurs for large pre-audit deficits (Quintile 5). The high incidence of downward adjustments in the middle quintile (small deficits and surpluses close to zero) is consistent with auditors acting to counter the management of earnings for the purposes of small loss avoidance (Ballantine *et al.*, 2007).

The results shown in Panels B and C, which present the mean and median of scaled adjustments and relative adjustments, follow a similar pattern to that found in Panel A.

Our analysis so far shows that downward adjustments dominate over upward adjustments irrespective of whether the Trust has a pre-audit deficit or surplus. Whilst the audit adjustments in relation to deficit observations are consistent with the reduction of management bias, the results for surplus observations suggest that management bias is increased. We investigate this proposition further by investigating whether or not audit adjustments serve to reduce discretionary accruals. Discretionary accruals represent a Trust-year measure of bias in financial reporting. Table 6 Panel A shows the direction of audit adjustments for observations with positive discretionary accruals, (which increase (reduce) reported surpluses (deficits)), and where we would therefore expect to see downward audit adjustments. As a result of the lagging in discretionary accruals our sample is reduced from 721 to 568 observations.

The results show that, overall, downward adjustments (59) exceed upward adjustments (32) consistent, overall, with the reduction of management bias. This

ANALYSIS OF AUDIT ADJUSTMENTS BY PRE-AUDIT SURPLUS AND DEFICIT

Panel A: Incidence of audit adjustments by pre-audit surplus and deficit

Pre-audit	Upward Adjustments		Downward Adjustments			z-stat.[†]
	No. of obs.	Percent	No. of obs.	Percent	Total obs.	
Surplus	56	39%	89	61%	145	5.629[***] (0.000)
Deficit	34	41%	48	59%	82	3.140[***] (0.002)
Total number of adjustments					227	

Panel B: Magnitude of audit adjustments by pre-audit surplus and deficit

		Upward Adjustments			Downward Adjustments			t-stat.[†]
		Mean	Median	Max	Mean	Median	Max	
Scaled adjustments[a] (%)	Surplus obs.[c]	0.4	0.1	6.8	0.4	0.1	8.2	-0.018 (0.985)
	Deficit obs.[d]	0.4	0.1	2.1	1.2	0.1	14.2	-1.592 (0.115)
Relative adjustments[b] (%)	Surplus obs.[c]	65.0	9.3	1,162.0	104.4	4.5	5,079.0	2.169[**] (0.032)
	Deficit obs.[d]	33.5	3.8	327.0	63.3	3.4	1,089.0	-2.578[**] (0.012)

Notes:
p-value in parentheses; ***$p<0.01$, **$p<0.05$
[a]Scaled adjustments: audit adjustments scaled by pre-audit total revenue;
[b]Relative adjustments: audit adjustments scaled by pre-audit earnings;
[c]Surplus obs.: observations with pre-audit surplus;
[d]Deficit obs.: observations with pre-audit deficit.
[†]The z-test compares the two sample percentages to establish whether the incidence of upward adjustments is statistically different from the incidence of downward adjustments. The t-stat tests whether the means of the two samples are statistically different.

picture is similar for both surplus and deficit observations. Further, in the case of deficit observations, the scaled downward adjustments (mean 1.55%) are much higher than the scaled upward adjustments (mean 0.58%). This, however, is not so evident for surplus trusts.

Panel B shows the results for Trust observations with negative discretionary accruals (which reduce (increase) reported surpluses (deficits)) where we would expect audit adjustments to be upward. This panel shows overall that there is little difference between the incidence and scale of downward and upward adjustments, except for deficit observations where the scale of downward adjustments is higher. Panel B thus suggests that the impact of audit adjustments on negative discretionary accruals does not have a bias in either direction.

Multivariate Analysis

Table 7 presents the results of our multivariate investigation to establish whether the probability of an audit adjustment which reverses management bias is higher

Table 5

QUINTILE ANALYSIS OF ADJUSTMENTS TO PRE-AUDIT EARNINGS.

Panel A: Incidence and percentage of adjustments

Quintiles	Exp.	Upward Adjustments		Downward Adjustments	
		No. of obs.	Percent of total	No. of obs.	Percent of total
Q1	+++	17	11.81	28	19.44
Q2	++	18	12.50	22	15.28
Q3	+/−	16	11.11	25	17.36
Q4	−−	26	18.06	24	16.67
Q5	−−−	13	9.03	38	26.39
Total		90		137	

Panel B: Adjustments scaled by revenue

Quintiles	Exp.	Upward Adjustments (%)		Downward Adjustments (%)	
		Mean of scaled adjustments	Median	Mean of scaled adjustments	Median
Q1	+++	0.44	0.08	1.44	0.16
Q2	++	0.35	0.06	0.85	0.03
Q3	+/−	0.72	0.14	0.72	0.07
Q4	−−	0.32	0.03	0.20	0.04
Q5	−−−	0.25	0.14	0.38	0.13

Panel C: Adjustments scaled by pre-audit value of earnings (surplus/deficit)

Quintiles	Exp.	Upward Adjustments (%)		Downward Adjustments (%)	
		Mean of relative	Median	Mean of relative adjustments	Median
Q1	+++	8.20	3.43	19.85	2.93
Q2	++	78.88	14.04	114.78	5.99
Q3	+/−	154.21	40.09	339.05	14.72
Q4	−−	24.45	2.97	16.02	2.66
Q5	−−−	8.85	1.37	10.21	3.45

Note:
Q1 +++ = top 20% of surplus (biggest surplus); Q2 ++ = second top 20% surplus; Q3 +/− = middle 20% with small surplus or deficits; Q4 −− = second bottom 20% deficits; Q5 −−− = bottom 20% of deficits (biggest deficits).

than the probability of an audit adjustment which does not. We examine whether there is such a relationship for the whole sample (column 1), for pre-audit surplus observations (column 2), and for pre-audit deficit observations (column 3). As a result of lagging in the estimation of discretionary accruals our sample size falls from 227 to 172.

Column 1 shows that the coefficient on *DA* is positive but not significant, indicating that the probability of an audit adjustment which reverses management

TABLE 6

AUDIT ADJUSTMENTS AND DISCRETIONARY ACCRUALS.

Panel A: Audit adjustments for observations with positive discretionary accruals

	Upward Adjustments			Downward Adjustments			Total obs.	
	No.	% of total obs.	Scaled AA mean[a] (%)	No.	% of total obs.	Scaled AA mean[a] (%)	No.	%
Total	32	10.63	0.33	59	19.60	0.83	301	100
Surplus	23	12.11	0.24	35	18.42	0.34	190	100
Deficit	9	8.11	0.58	24	21.62	1.55	111	100

Panel B: Audit adjustments for observations with negative discretionary accruals

	Upward Adjustments			Downward Adjustments			Total obs.	
	No.	% of total obs.	Scaled AA mean[a](%)	No.	% of total obs.	Scaled AA	No.	%
Total	39	14.61	0.49	42	15.73	0.44	267	100
Surplus	20	13.51	0.68	26	17.57	0.61	148	100
Deficit	19	15.97	0.37	16	13.45	0.56	119	100

The total number of observations is 568, falling from 721, as a consequence of lagging in the estimation of discretionary accruals.
Note:
[a]Scaled AA mean: mean value of (audit adjustment divided by pre-audit revenue).

bias is not significantly higher than one which does not. We further investigate this finding by splitting the sample into pre-audit surplus and deficit observations.[15] Column (2) shows the results for pre-audit surplus observations only. The findings are similar to column (1). Column (3), however, shows that, for pre-audit deficit observations the probability of an audit adjustment which reverses management bias is significantly higher (coefficient 0.835, $p < 0.05$) than one which does not.

Overall, these findings are consistent with the theoretical prediction that auditors, consistent with incentives to avoid reputation loss, will apply more audit effort in deficit Trusts than in surplus Trusts.[16]

[15] An alternative to partitioning our sample would be to include a binary variable to distinguish between deficit and surplus observations. This should reveal the relative impact of a deficit (or surplus) on the probability of an audit adjustment which reverses management bias. However, this assumes that a statistically significant relationship exists for both surplus and deficit observations. In our investigation, for surplus observations, there is no statistically significant relationship between the direction of audit adjustments and the direction of discretionary accruals, so putting a binary variable has no significant effect on our results.

[16] We repeat our analysis using an OLS estimator for discretionary accruals using a scaled constant and suppressing the true constant (Peasnell *et al.*, 2000). The estimation of discretionary accruals using this model is not statistically reliable as no statistically significant relationship between total accruals and PPE and Δ(Rev-Rec) is found. Notwithstanding this, the results of the regression are similar in both size and significance to those reported in Table 7.

TABLE 7

IS THE PROBABILITY OF AN AUDIT ADJUSTMENT WHICH REVERSES MANAGEMENT BIAS HIGHER THAN ONE THAT DOES NOT?

Variables		(1)	(2)	(3)
		Full sample	Surplus obs.	Deficit obs.
		AA	*AA*	*AA*
DA	Direction of discretionary accruals (1/0)	0.247	0.072	0.835**
		(0.208)	(0.264)	(0.374)
InSIZE	FT size measured by total assets	0.011	0.105	0.183
		(0.161)	(0.238)	(0.295)
liq	FT liquidity	−0.168	0.119	0.046
		(0.197)	(0.286)	(0.349)
FTtype[1]	Mental health trusts	0.331	0.669**	−0.452
(Base group: Acute)		(0.202)	(0.263)	(0.468)
	Other trusts including ambulance and specialists	0.886**	1.057**	0.153
		(0.374)	(0.456)	(0.881)
AUDFEE	Log audit fee	−0.038	−0.162	0.427
		(0.216)	(0.391)	(0.377)
Auditor[2]	AC[3]	−0.154	−0.833	
(Base group: Big 4)		(0.608)	(0.638)	
	Second-tier audit firms	−0.308	−0.180	−0.486
		(0.366)	(0.504)	(0.519)
Constant		0.090	−0.878	−4.655
		(2.103)	(3.027)	(3.484)
Year	Year control	Yes	Yes	Yes
Observations		172	104	68
pseudo R-sq		0.053	0.084	0.153

Cluster robust standard errors in parentheses
** $p < 0.05$, * $p < 0.1$
Notes:
[1]*FTtype*: A categorical variable for acute hospital trusts, mental health trusts, and others (including ambulance and specialist trusts); with acute hospital trusts set as the reference group.
[2]*Auditor*: this paper categorizes auditors as: Big 4, Audit Commission (AC) and second-tier audit firms (including Grant Thornton, BDO, Mazars and Baker Tilly); and sets Big 4 as the base group.
[3]*AC*: The audit practice of the Audit Commission (Auditor for NHS Trusts and NHS Foundation Trusts before 2013, was transferred to private sector firms as from 2013). There is no coefficient for the AC control in column (3) because there were no observations in this category.

Audit adjustments, as with other independent indicators of financial reporting quality,[17] capture both intentional earnings management and unintentional errors (Dechow *et al.*, 2010). Our descriptive statistics in Table 2 show that there are some large adjustments in our sample. These adjustments could be indicative of wider problems within the finance function. We test the robustness of our results by omitting the largest 1% of upward and downward adjustments and re-run our

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[17] In the private sector these are usually associated with capital markets and include financial restatements and SEC enforcement releases (Dechow *et al.*, 2010).

multivariate test. The results are not only similar to those reported in Table 7 but the coefficient on *DA* is twice as big (1.692).

Our findings make no claims as to the quality of financial reporting in those instances where there is no audit adjustment. These observations will include those instances where auditors judge that the bias in reporting is within GAAP acceptable limits including materiality limits (as in the example of South Derbyshire Clinical Commissioning Group, cited earlier).

DISCUSSION AND CONCLUSIONS

Overall our results indicate that audit adjustments mitigate management bias for Trusts with a pre-audit deficit but not for those with a pre-audit surplus. They are consistent with auditors acting as rational self-interested agents and that, in the case of surplus organizations, incentives to challenge management bias are weak. Failure to mitigate, and perhaps even enhance, management bias in the majority of Trusts that operate with a small surplus suggests an overall bias downwards in reporting across the whole sample. Whilst such a downward bias is protective of management and auditor interests, and is consistent with prior research on audit adjustments in both the private and public sectors, it is arguable that such bias is not consistent with effective resource allocation decisions both within the NHS and across government departments. Further, whilst management have incentives to protect against uncertainty in future costs and revenues, patients, the public, and Parliament may give a higher priority to the overall quantity and quality of services delivered for the funds provided.

Our study contributes to the limited number of studies that investigate audit adjustments, most of which have been set in the private sector. In particular, we add to the research that indicates that audit adjustments mitigate management bias (Lennox *et al.*, 2018, 2016). Our paper adds to this literature in the following ways. First it includes an analysis of both auditor and management incentives in a public sector setting where the incentive framework is both different and weaker from that in the private sector. Second, our investigation represents an early attempt, in the public sector, to evaluate whether auditors act to reduce management bias in the reporting of surpluses/deficits. Third, the finding that auditor adjustments do not reduce management bias for a substantial proportion of observations raises questions about the value of audit services and suggests the need for further research. However, although our sample size is larger than in many previous studies of audit adjustments, it is nonetheless modest in size and this has precluded more refined analysis, such as whether there is a relationship between the size and direction of the audit adjustments and the size and direction of discretionary accruals. Given the potential significance of our findings, however, further research into the question of whether auditors reduce bias in public sector financial statements would be beneficial both from an academic and policy perspective.

With respect to policy our analysis suggests that measures that better align the interests of auditors with those of principals, would benefit the quality of financial reporting. This could include adjustments to auditor training, to the audit guidance issued by Monitor,[18] and to the focus of quality monitoring now undertaken by the Financial Reporting Council. The role of audit committees, which play an important role in holding the auditor to account, may also warrant consideration.

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[18] From 1 April 2015 this role has been adopted by the National Audit Office (NAO), as for NHS Trusts and local authorities.

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