BANKRUPTCY, AUDITOR SWITCHING AND AUDIT FAILURE: EVIDENCE FROM THE UK 1987-94.

CLIVE S. LENNOX

Department of Economics, Royal Holloway College, University of London.

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Address for correspondence:

7 Cypress Walk, Englefield Green, Egham, Surrey, TW20 OPA, United Kingdom.

C.Lennox@rhbnc.ac.uk

Tel: (0)1784-438748 *Fax: (0)1784-439534*

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Abstract

If a company's auditor believes that the company is likely to enter bankruptcy, the auditor is required to warn investors by giving a 'qualified' audit report. This paper investigates whether auditor switching can help explain why auditors frequently fail to warn about impending bankruptcy. The paper shows that managers use the switch decision to avoid receiving qualified reports and a switch exogenously reduces the accuracy of audit reports by replacing established incumbent auditors with less well informed new auditors. These results mean that the use of switching by managers is not necessarily contrary to investors' interests. Moreover, policies aimed at reducing managerial influence - for example, a recent EC policy proposal recommended the compulsory periodic switching of auditors - could reduce the accuracy of audit reports.

1. Introduction

During the 1980s and early 1990s there were a number of well-publicised cases in which auditors were criticised following corporate failure, leading to concerns that auditors are failing to give investors adequate warnings about bankruptcy.[1] Empirical evidence indicates that auditors rarely give qualified reports to companies that subsequently file for bankruptcy (Altman and McGough, 1974; Koh, 1991; Citron and Taffler, 1992; Author, 1998). This does not necessarily imply that auditors are failing in their responsibilities; the low predictive power of most statistical bankruptcy models suggests that auditors may not accurately warn about impending failure simply because bankruptcy is a rather unpredictable event.

However, there are three reasons for believing that audit reports are not as accurate as they could be. First, previous studies have found that audit reports are poor indicators of financial distress compared to the predictions of bankruptcy models (Altman and McGough, 1974; Deakin, 1977; Koh, 1991; Author, 1998). This is surprising since auditors have access to information that is not available to statisticians whereas the bankruptcy models were estimated using publicly available information. Secondly, the number of successful litigation cases brought against auditors and the sizes of the awards suggest that auditors sometimes fail in their responsibilities towards shareholders (Author, 1998). Finally, Department of Trade and Industry (DTI) investigations into UK corporate collapses have often been critical of auditors.

[1] If a company's auditor believes that there is a significant possibility that the company will enter bankruptcy in the 'foreseeable future', the auditor is required to alert shareholders by giving a 'going concern qualification' in the audit report. The Auditing Guideline on Going Concern (1985) states, "The going concern concept identified in Statement of Standard Accounting Practice [SSAP] No. 2 is 'that the enterprise will continue in operational existence for the foreseeable future'. This means in particular that the profit and loss account and the balance sheet assume no intention or necessity to liquidate or curtail significantly the scale of operation' . . . There is a presumption in both law and accounting standards that the financial statements are prepared on a going concern basis . . . The foreseeable future . . . should normally extend to a minimum of six months following the date of the audit report or one year after the balance sheet date whichever period ends on the later date. It will also be necessary to take account of significant events which will or are likely to occur later." The rationale for the existence of going concern qualifications is to warn investors that the company's financial statements are reported under the assumption that the company will remain a going concern. In the event of liquidation, the value of the company may be very different to that reported in the accounts. However, the auditor is required to ensure that shareholders are warned about impending bankruptcy, even if the reported value of the company corresponds to its liquidation value. The Auditing Guideline states, 'Where there is significant uncertainty about the enterprise's ability to continue in business, this fact should be stated in the financial statements even where there is no likely impact on the carrying value and classification of assets and liabilities'.

The aim of this paper is to determine whether switching helps explain why auditors frequently fail to warn about impending bankruptcy. Section 2 reviews the existing literature on auditor switching and audit reporting. Section 3 describes how the sample was collected and compares the characteristics of the data to previous research. Section 4 describes the models estimated and the hypotheses that are tested. Section 5 presents the results and section 6 concludes.

2. Existing research

There are three stylised facts concerning the relationship between financial health, auditor switching and audit reporting. First, failing companies are more likely to switch auditor than non-failing companies, and a switch of auditor appears to be a signal of financial distress (Fried and Schiff, 1981; Eichenseher *et al.*, 1989; Albrecht, 1990; Menon and Schwartz, 1985).

Secondly, a change in auditor is more likely to occur following a qualified report (Chow and Rice, 1982; Craswell, 1988; Krishnan *et al.*, 1995, 1996). This indicates that switches can occur because companies try to avoid receiving qualified reports.[2] However, these studies did not make clear why opinion-shopping might cause a positive correlation between lagged audit reports and auditor switching. In particular, opinion-shopping means that a company is more likely to switch if this *subsequently* reduces the probability of receiving a qualified report.

Finally, the reports of switching companies tend to become less favourable compared to non-switching companies, and the post-switch reports of switching companies are not generally more favourable than pre-switch reports (Chow and Rice, 1982; Krishnan *et al.*, 1995). This has led some to suggest that opinion-shopping by companies is generally futile (Krishnan, 1994). However, this conclusion could be misleading because one should really compare the reports that companies actually receive following their switch decisions, with the reports companies would have received had they made different switch decisions. This distinction is particularly important if auditors condition their reporting strategies on companies' switch decisions.

Theoretical research on 'opinion-shopping' behaviour has shown how companies can strategically use the switch decision to obtain more favourable reports (Dye, 1993; Teoh, 1992). One limitation of these models is their assumption that auditors cannot condition their reporting strategies on companies' switch decisions. In contrast, Author (1998) has shown that when auditors take account of past switch decisions, a switch can exogenously increase the probability of a qualified report.[3] In the model auditors have different information sets, and so audit reporting is more persistent when companies choose not to switch their auditor. This means that a switch increases the probability that an independent auditor gives a qualified report. Since failing companies are more likely to receive qualified reports compared to non-failing companies, failing companies are more likely to switch and a switch is a signal of financial distress. This means that an independent auditor is more likely to give a qualified report to a company that chooses to switch. To test whether companies successfully engage in opinion-shopping, the model demonstrates that one should explicitly control for the unobservable reports that companies would have received had they made different switch decisions.

One contribution of this paper is to show that when one controls for these unobservable reports, the evidence very strongly supports the view that companies do engage in opinion-shopping. In addition, the paper investigates whether auditor switching has exogenous effects on the 'conservatism' and 'accuracy' of audit reports.

[2] It seems reasonable to assume that managers dislike audit qualifications - a qualified report may signal to investors that the managers are poor stewards of the company's affairs or that managers have attempted to present an over-favourable view of the company's performance. If managers also have some influence over the hiring and firing of auditors, a manager may choose to switch (retain) the auditor if he believes that the incumbent auditor is more (less) likely to give a qualified report than is a new auditor. In the accounting literature this is known as 'opinion-shopping'.

[3] See enclosed paper

To help explain what is meant by 'conservatism' and 'accuracy', it is helpful to consider Fig. 1. The horizontal axis shows an auditor's expectations about its clients' bankruptcy probabilities (P). The vertical axis shows the density function f(P). The figure illustrates the case where an auditor believes that most clients have low bankruptcy probabilities.

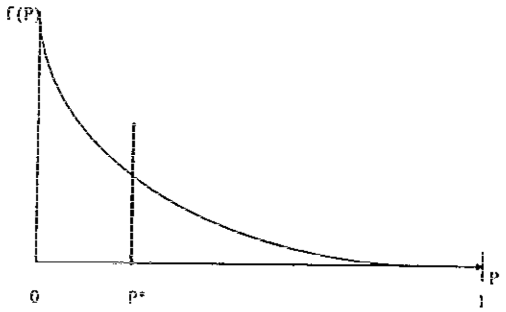

FIG 1. An auditor's expectations about its clients' bankruptcy probabilities

Existing research has assumed that if auditors strictly follow their profession's rules, they should give qualified reports to those companies that are most likely to enter bankruptcy (Altman and McGough, 1974; Deakin, 1977; Koh, 1991). The number of qualified reports is determined by the auditor's choice of a cut-off probability, P*; companies lying to the left of P* are given unqualified reports whilst companies lying to the right are given qualified reports. P* determines the conservatism of audit reports - ceteris paribus, a lower P* implies an increase in conservatism (i.e. an increase in the frequency of audit qualifications).

One can measure the accuracy of audit reports by defining two types of reporting error. The type I error rate is equal to the proportion of failing companies that are given unqualified reports; the type II error rate is equal to the proportion of non-failing companies that are given qualified reports (Koh, 1991). Hence there is an important distinction between

the accuracy and conservatism of audit reports. An increase in conservatism corresponds to a lower P* which reduces the type I error rate and increases the type II error rate, for a given level of accuracy. On the other hand, an increase in accuracy reduces both the type I and type II error rates, for a given level of conservatism.

If switching and non-switching companies use the switch decision to avoid receiving qualified reports, the conservatism of audit reports is reduced (P* is increased). This raises the type I error rate and lowers the type II error rate. Whether this is in investors' interests depends on the relative costs of type I and type II errors.

If a switch is a signal of financial distress, the auditor may be more (less) likely to give a qualified report to a company that chooses (does not choose) to switch (Author, 1998). This means that for companies that choose (not) to switch, auditors choose a relatively low (high) P*. This tends to lower (raise) the type I error rate and raise (lower) the type II error rate for switching (non-switching) companies.

Finally, a switch may exogenously affect the overall accuracy of audit reports. For example, a new auditor may be less familiar with a client than an established incumbent auditor, and so switching may increase both the type I and type II error rates for a given level of conservatism. These issues are of great relevance to policy-makers - in response to concerns that long auditor-company relationships might facilitate collusion and reduce the conservatism of audit reports, the European Community 8th Directive called for compulsory auditor switching every five years.

3. The Data

3.1. *The sample*

An attempt was made to collect data on all quoted UK companies between 1987-94.[4] The data were collected in two stages. First, information on company shareholdings, auditors, and

[4] A company is defined as being a UK company if its headquarters and auditor were based in the UK. However, many of the companies in the sample had overseas operations and overseas shareholders

audit reports was collected from microfiche copies of companies' annual reports.[5] From each report it was noted whether the auditor had given a qualified or unqualified opinion.[6] When there is a significant possibility of the company ceasing to trade in the foreseeable future, the auditor is required to state that the accounts give a true and fair view subject to the company remaining a going concern - a qualification given for this reason is called a 'going concern qualification'.[7] In the data, qualifications are given for going concern issues, fundamental uncertainties, and non-compliance with Statements of Standard Accounting Practice (SSAPs) - a qualification given for any of these reasons is called a 'general qualification'.[8]

A list of companies that entered administration, receivership or liquidation was obtained from Stock Exchange Financial Yearbooks. All such companies are defined in this paper as failing.[9] In the population of UK quoted companies, there were 160 failing companies between 1987-94. Microfiche data were available for 1036 companies of which 123 failed during the sample period.

Next data on cashflow, profitability and leverage ratios, and numbers of employees were collected from Datastream.[10] The Confederation of British Industry (CBI) Quarterly Industrial Trends Surveys were consulted to investigate changes in business confidence because leading indicators of the economic cycle might be useful in predicting when bankruptcies are most likely to occur. Every four months, the CBI publishes the results of a questionnaire asking companies, "Are you more, or less, optimistic than you were four

[5] These are located in the Corporate Information Library at Warwick University. At this stage, I imposed the restriction that the company should have microfiches available for at least two consecutive years, because theory predicts that there are likely to be persistence effects in audit reporting. Data on companies that were taken over were collected up to the point of takeover, and thereafter these companies were treated as missing observations

[6] An audit report is unqualified if the auditor states that the accounts give a 'true and fair' view of the company's affairs. A qualified audit report occurs when the auditor states that the accounts give a true and fair view subject to some disclaimer, or in more extreme circumstances the auditor can state that the accounts do not give a true and fair view

[7] In a couple of cases the auditor did not give a going concern qualification but did draw attention to going concern problems mentioned elsewhere in the financial statements. These cases were treated as going concern qualifications because the auditor ensured that going concern problems were brought to the attention of investors.

[8] 'Fundamental uncertainties' refers to circumstances where an auditor is uncertain about provisions made for tax, slow-moving stocks, bad debts or litigation

[9] The results reported in this paper are not sensitive to different kinds of corporate failure - this may be because relatively few (13) failing companies entered administration

[10] These variables are defined in Table 2.

months ago about the general business situation in your industry?" By subtracting the proportion of respondents answering "less optimistic" from that answering "more optimistic", a variable (CBI_t) was constructed to capture business confidence.[11] Data on each company's Standard Industrial Classification (SIC) codes were collected from Extel, because industry sector is also likely to be an important determinant of bankruptcy. Data for some of the 1036 companies in the initial sample were unavailable from Datastream and Extel. The final sample comprised 976 companies of which 90 failed over the sample period.[12]

3.2. *Bankruptcy and audit reporting between 1987-94.*

Table 1 shows the pattern of bankruptcy, audit reporting and auditor switching over the period 1987-94. Row 1 shows the total number of companies for which data were available in the initial sample. Row 2 shows the number of quoted companies in the population that failed. Given the timing of the economic cycle, it is unsurprising that the majority of failures occurred between 1990-2. A comparison of rows 2 and 4 shows that there is typically a period of around a year between the last annual report of a failing company and its entry into bankruptcy.

[11] For each year, the results from the April questionnaire were used.

[12] Companies with missing observations were not dropped from the sample because this could cause problems of sample selection bias. There are two reasons why the presence of missing observations is not likely to cause problems. First, there are not very many missing observations - the majority of companies (653) have a complete panel of data covering all eight years. Secondly, when the sample proportion of companies differs from the population proportion, the logit model has consistent coefficient estimates for all variables except the constant (Anderson, 1972). For all models reported in this paper, the results from the probit and logit models were found to be very similar and so sample selection bias does not seem to be a problem. In moving from the initial sample to the final sample, 10% of all types of company were lost, whilst 27% of failing companies were lost. This reflects the fact that it is difficult to obtain data on failing companies from Datastream. Due to the small number of failing companies, every effort was made to obtain data through requests to Datastream. The small number of failing companies in the final sample may be viewed as a limitation of this paper. However, the characteristics of the audit data for the 90 failing companies included in the final sample are similar to those for the 33 failing companies for which financial data were unavailable. Therefore, there is reason to believe that the main conclusions would not have been different had financial data been available for all 123 failing companies in the initial sample.

TABLE 1

Financial health and audit reporting (1987-94).

	1987	1988	1989	1990	1991	1992	1993	1994	Total
S_t	799	862	903	927	925	908	897	883	7104
F_t	4	5	6	36	46	41	15	7	160
CBI_t	29	18	-5	-23	-17	8	30	13	.
$NFAILS_t$	5	13	31	35	26	8	3	2	123
NQ_t	12	13	9	33	38	33	32	33	203
$NGCQ_t$	1	3	3	20	27	26	22	23	124
NSW_t	.	34	25	26	38	39	27	35	224

Notes:

S_t = Number of observations in the sample in year t.
F_t = Number of UK publicly quoted companies in the population entering bankruptcy in year t.
CBI_t = Proportion of respondents answering 'more' minus the proportion answering 'less' in the CBI questionnaire.
$NFAILS_t$ = Number of companies in the sample which issue their final annual reports in year t, prior to entering bankruptcy.
NQ_t = Number of companies in the sample receiving general qualifications in year t.
$NGCQ_t$ = Number of companies in the sample receiving going concern qualifications in year t.
NSW_t = Number of companies in the sample switching auditor in year t.

Row 3 shows that the CBI_t variable is quite a good leading indicator of future economic conditions. Although the actual number of failing companies was quite low in 1989, most respondents were pessimistic about the future - companies partially anticipated the recession of 1990-2. In 1992 business confidence improved even though the actual number of failing companies remained high - companies partially anticipated the recovery of 1993-4. Rows 5 and 6 show that the number of qualified reports jumped up in 1990 and remained high during the recovery of 1993-4. This suggests that auditors failed to anticipate the recession of 1990-2 and the recovery of 1993-4. Row 7 shows the number of switches occurring between 1988-94.[13] The average rate of auditor switching is 3.16%, implying that the average period of auditor incumbency is 31.6 years - companies rarely switch auditor.[14]

[13] Since the start of the sample period is 1987, it is only possible to identify auditor switches occurring between 1988-94

[14] Out of the 224 switches shown in row 7, no company switched more than twice - 186 companies switched just once, whilst 19 companies switched twice

3.3. *Financial health, auditor switching and audit reporting*

Table 2 shows the correlations between financial health, auditor switching, lagged audit reports and current reports. Panel A shows that failing companies are more likely to receive qualified reports and are more likely to switch. Panel B shows that companies are more likely to switch following qualified reports - this is true for both failing and non-failing companies. The evidence also indicates that switching companies are more likely to subsequently receive qualified reports compared to non-switching companies. For the 224 observations in which a switch occurred, 19 companies (8.5%) received qualified reports. For the 5868 observations in which no switch occurred, 168 companies (2.9%) received qualified reports. These results are consistent with previous empirical research as described in section 2.

Finally, panel C shows that there is a strong positive correlation between lagged and current reports, and this correlation is greater for companies that do not switch. For the 124 companies that received qualified reports and chose not to switch, 63 (50.8%) received qualified reports in the following period. For the 21 companies choosing to switch following qualified reports, 6 (28.6%) received qualified reports in the following period. For the 5704 observations where companies received qualified reports and chose not to switch, 102 (1.8%) received qualified reports in the following period. For the 203 companies choosing to switch following unqualified reports, 13 (6.4%) received qualified reports in the following period. This suggests that audit reporting is more persistent when companies decide not to switch - this is unsurprising since a new auditor is likely to have different beliefs about a company's financial health, compared to an incumbent auditor.

TABLE 2

Financial Health, Successive Audit Reports and Auditor Switching

Panel A - Relationship between Bankruptcy and Audit Reporting, and Bankruptcy and Auditor Switching

	$Q_{it} = 0$	$Q_{it} = 1$	$SW_{it} = 0$	$SW_{it} = 1$
$FAILS_{it} = 0$	6804	177	5767	210
$FAILS_{it} = 1$	97	26	101	15

Panel B - Relationship between Lagged Audit Reports and Auditor Switching, and Auditor Switching and Current Audit Reports

	$FAILS_{it} = 0$		$FAILS_{it} = 1$		$FAILS_{it} = 0$		$FAILS_{it} = 1$	
	$Q_{it-1} = 0$	$Q_{it-1} = 1$	$Q_{it-1} = 0$	$Q_{it-1} = 1$	$Q_{it} = 0$	$Q_{it} = 1$	$Q_{it} = 0$	$Q_{it} = 1$
$SW_{it} = 0$	5636	116	92	8	5620	147	80	21
$SW_{it} = 1$	193	17	11	4	196	14	9	5

Panel C - Relationship between Lagged and Current Reports

	$SW_{it} = 0$		$SW_{it} = 1$	
	$Q_{it-1} = 0$	$Q_{it-1} = 1$	$Q_{it-1} = 0$	$Q_{it-1} = 1$
$Q_{it} = 0$	5626	61	190	15
$Q_{it} = 1$	102	63	13	6

Notes:
1. The results are reported for the initial sample of 1036 companies.
2. $FAILS_{it}$ = 1 if company i issues its final annual report in year t prior to entering bankruptcy; = 0 otherwise.
3. Q_{it} = 1 if company i receives a qualified report in year t; = 0 otherwise.
4. SW_{it} = 1 if company i hires a new auditor in year t; = 0 otherwise.

3.4. *Financial distress variables*

Previous research indicates that cashflow, leverage, profitability and company size are related to financial distress (Altman, 1986). Data on these variables were obtained from Datastream and are defined in Table 3. The return on capital variable (ROC_{it}) measures profitability whilst the capital gearing variable ($CAPG_{it}$) is a measure of leverage. The gross cashflow (GCF_{it}), debtor-turnover ($DBTN_{it}$) and cash ratio ($CASHRAT_{it}$) variables measure cashflow. GCF_{it} measures profit-generated cashflow. $DBTN_{it}$ captures the effects of debtor repayment - if $DBTN_{it}$ is low, the company may be experiencing problems in receiving payment for past sales. $CASHRAT_{it}$ captures the ability of the company to meet its short-term liabilities through cash reserves.

TABLE 3

Company size, cashflow, leverage and profitability variables

Variable	*Definition*	*Datastream number*	*Interpretation*
EMP_{it}	Total number of employees	219	Company size
$DBTN_{it}$	$\frac{\text{(Total sales)} \times 100}{\text{Total debtors}}$	726	Debtor-turnover ratio
$CASHRAT_{it}$	$\frac{\text{(Total cash)} \times 100}{\text{Current liabilities}}$	743	Cash ratio
GCF_{it}	$\frac{\text{(Profits earned for ordinary shareholders + Depreciation + Tax equalisation)} \times 100}{\text{Capital employed + Current liabilities - Intangibles}}$	735	Gross cashflow ratio
$CAPG_{it}$	$\frac{\text{(Preference capital + Subordinated debt + Loan capital + Short-term borrowings)} \times 100}{\text{Capital employed + Short-term borrowing - Intangibles - Future income tax benefits}}$	731	Capital gearing ratio
ROC_{it}	$\frac{\text{(Total interest charged + Pre-tax profit)} \times 100}{\text{Capital employed + Short-term borrowing - Intangibles - Future income tax benefits}}$	707	Return on capital ratio

Table 4 shows the number of companies operating in each main industry sector - companies operating in construction and financial services were more likely to fail than companies operating outside of these sectors.

TABLE 4

Number of companies operating in each industry

SIC code	*Industry sector*	*Number of companies in sample*	*Number of failing companies in sample*
0	Agriculture	19	0
1	Energy and water	31	4
2	Extraction of minerals and ores	137	7
3	Metal goods	275	28
4	Other manufacturing	274	26
5	Construction	100	23
6	Distribution, hotels and catering	411	36
7	Transport and communication	47	5
8	Banking, finance and insurance	255	46
8500	Owning and dealing in real estate	151	27
9	Other services	84	9
	Total	1784	211

Notes.
1. Standard Industrial Classification (SIC) codes were collected at the one-digit level, with the exception of classification 8500 because of the volatile nature of the housing market over the sample period.
2. Unfortunately, Extel only gives details on companies' most recent activities. It is likely that companies' core activities remained fairly constant over the sample period and so measurement error problems are not likely to be serious.
3. Classification '8' refers to industries whose first digit begins with an '8' but do not belong to classification '8500'
4. The total of 1784 is greater than the actual number of companies in the final sample (976) because some companies operated in more than one industry sector

3.5. *Agency cost variables*

Evidence from event studies indicates that a switch of auditor is a signal of financial distress (Fried and Schiff, 1981; Eichenseher *et al.*, 1989; Albrecht, 1990). Therefore, one might find that a company has more incentive to avoid a switch when agency costs are high. Agency costs arise from the separation of ownership from control as it is costly for the owner(s) to monitor managerial behaviour. In this paper, they are measured using data on directors' and other large shareholdings. Table 5 shows that these shareholdings are inversely related to company size.

TABLE 5
The relationship between company size and the shareholdings of directors and other large shareholders

Variable	Number of employees	Number of companies	Mean	Standard deviation
$DIRSH_{it}$	0 - 149	160	25.91	21.49
$LARGSH_{it}$	0 - 149	160	15.64	15.52
$DIRSH_{it}$	150 - 399	189	24.47	21.13
$LARGSH_{it}$	150 - 399	189	14.79	14.92
$DIRSH_{it}$	400 - 999	245	23.36	21.09
$LARGSH_{it}$	400 - 999	245	12.04	12.96
$DIRSH_{it}$	1000 - 1999	128	10.32	13.32
$LARGSH_{it}$	1000 - 1999	128	13.01	14.65
$DIRSH_{it}$	2000 - 4999	116	9.05	13.79
$LARGSH_{it}$	2000 - 4999	116	14.52	16.52
$DIRSH_{it}$	≥ 5000	170	4.00	8.93
$LARGSH_{it}$	≥ 5000	170	9.88	15.79

Notes
1 $DIRSH_{it}$ = The percentage of ordinary shareholdings held by the directors
2 $LARGSH_{it}$ = The percentage of ordinary shareholdings held by other large shareholders
3 Data were collected on the ordinary shareholdings of directors which are expressed as a percentage of issued ordinary share capital
4 Shareholding data were not collected for all observations because of the high cost of collecting this information. For companies which did not switch auditor over the study period, shareholding information was only collected for 1990 and is used as a proxy for the missing observations in other years. In practice, this is unlikely to cause measurement error problems since ownership patterns typically exhibit little variation over time. For companies that did switch auditor, shareholding data were collected for all years. This was done because companies are more likely to switch when they are expanding or declining in size and companies that are experiencing substantial changes in the scale of operations are likely to experience large changes in share ownership.
5 Large shareholdings held by individuals, companies and trust funds are only disclosed in the accounts if they exceed 5%. For each company, the sum of these excess shareholdings was calculated. For example, suppose that company i has the following large shareholders in year t:
Individual A: 8% Individual B: 10% Individual C: 5.5%
For this observation, $LARGSH_{it}$ would be calculated as follows: $LARGSH_{it} = (8-5) + (10-5) + (5.5-5) = 8.5$
This calculation was used so as to avoid putting undue weight on observations with a lot of shareholdings only slightly in excess of 5%.

4. Research Methodology

This aim of this section is to describe how to test whether: (a) companies engage in opinion-shopping, (b) a switch is a signal of financial distress and exogenously increases the conservatism of audit reports, (c) a switch exogenously reduces the accuracy of audit reports.

4.1. *The structural models of bankruptcy, audit reporting and auditor switching*

The structural models of bankruptcy, audit reporting and auditor switching are shown in eqs. (1)-(3), with the variables defined in Table 6.

$$FAILS_{it}^* = \beta_0 + \beta_1 X_{1it} + \beta_2 Z_{1it} + \beta_3 Z_{2it} + u_{1it} \quad (1)$$

$$Q_{Sit}^* = \gamma_{0S} + \gamma_{1S} X_{1it} + \gamma_{2S} X_{2it} + \gamma_{3S} Z_{1it} + u_{2Sit} \qquad (S = 1, 2) \quad (2)$$

$$SW_{it}^* = \theta_0 + \theta_1 (Q_{1it}^* - Q_{2it}^*) + \theta_2 X_{1it} + \theta_3 X_{3it} + \theta_4 Z_{2it} + u_{3it} \quad (3)$$

where $u_{1it} \sim IID\ [0, var(u_{1it})]$, $u_{2it} \sim IID\ [0, var(u_{2it})]$, and $u_{3it} \sim IID\ [0, var(u_{3it})]$.

TABLE 6

Variable definitions

Variable	Definition
$FAILS_{it}$	= 1 if company i issues its final annual report in year t prior to entering bankruptcy; = 0 otherwise.
Q_{Sit}	= 1 if company i receives a qualified report in year t when in state S; = 0 otherwise.
SW_{it}	= 1 if company i hires a new auditor in year t; = 0 otherwise.
$FAILS_{it}^*$	≥ 0 if $FAILS_{it} = 1$; < 0 otherwise.
Q_{Sit}^*	≥ 0 if $Q_{Sit} = 1$; < 0 otherwise.
SW_{it}^*	≥ 0 if $SW_{it} = 1$; < 0 otherwise.
X_{1it}	A set of publicly observable variables capturing the financial health of company i in year t.
Z_{1it}	A set of publicly unobservable variables which capture financial health and are observable to the auditor.
Z_{2it}	A set of publicly unobservable variables which capture financial health and are observable to the company.
X_{2it}	A set of variables that are unrelated to financial distress but which help to explain audit reporting.
X_{3it}	A set of variables that are unrelated to financial distress and audit reporting but help explain auditor switching.

Eq. (1) is a bankruptcy model in which failing companies are distinguished from non-failing companies using observable variables relating to financial distress (X_{1it}). There may also be publicly unobservable variables which would be useful in identifying failing companies; some of these are observed by the auditor (Z_{1it}), and some are observed by the company (Z_{2it}). Eq. (1) assumes that the X_{2it} and X_{3it} variables do not help identify failing companies - the validity of this restriction is tested in the bankruptcy model.

Eq. (2) is a model of audit reporting. The model's coefficients depend on whether the company is in the switching ($S = 1$) or non-switching state ($S = 2$) - the company chooses to be in state 1 if it switches, whilst it chooses to be in state 2 if it does not switch. This equation is used to predict the reports that companies would have received had they made different switch decisions. The audit reporting decision is explained using publicly observable financial distress variables (X_{1it}), and by other variables that do not help to identify failing companies (X_{2it}). In addition, the auditor may have private information about

the probability of bankruptcy and this may affect the auditor's report (Z_{1it}).[15] Eq. (2) imposes the restriction that the X_{3it} variables do not affect audit reporting - the validity of this restriction is tested in the audit reporting model.

Eq. (3) is a structural model of auditor switching. The model allows auditor switching to depend on publicly observable financial distress variables (X_{1it}), since previous research indicates that financial health helps explain switching (Menon and Schwartz, 1985). Switching may also be affected by publicly unobservable financial distress variables (Z_{2it}). To the extent that the Z_{2it} variables have significant effects on switching, the company's switch decision may be a signal about whether the company is in financial distress. If a switch is a signal, one would expect auditors' reports to be conditioned on companies' switch decisions (Author, 1998). Under the null hypothesis that a switch does not exogenously increase the probability of a qualified report, $\gamma_{01} = \gamma_{02}$ in eq. (2). Under the alternative hypothesis, a switch exogenously increases the probability of a qualified report ($\gamma_{01} > \gamma_{02}$).

The switch decision also depends on variables that do not help to identify failing companies nor help explain audit reporting (X_{3it}). Finally, eq. (3) allows the company to engage in opinion-shopping since the switch decision depends on the reports the company would receive in the switching (Q_{1it}^*) and non-switching states (Q_{2it}^*). If companies do not engage in opinion-shopping, one should be unable to reject the null hypothesis that $\theta_1 = 0$. The alternative hypothesis is that companies successfully engage in opinion-shopping ($\theta_1 < 0$). Under the alternative hypothesis, when a new auditor is more likely to give a qualified report compared to the incumbent auditor ($Q_{1it}^* > Q_{2it}^*$) the company is less likely to switch; when a new auditor is less likely to give a qualified report compared to the incumbent auditor ($Q_{1it}^* < Q_{2it}^*$) the company is more likely to switch. Therefore, in controlling for the reports that companies would have received had they made different

[15] For example, an auditor has the statutory right to verify individual transactions and to check the values of individual assets and liabilities. The auditor can also engage in dialogue with management to try to ascertain future operating conditions.

switch decisions, my methodology is sufficiently flexible to allow both switching and non-switching companies to engage in opinion-shopping. Eq. (3) imposes the restriction that the X_{2it} variables do not affect switching in the structural model. This restriction cannot be tested because identification of eq. (3) depends on it. The validity of this restriction is based on theory and is discussed in section 5.2.

In equations (1)-(3), it is assumed that $E[u_{1it}\ u_{2Sit}] = 0$, $E[u_{2Sit}\ u_{3it}]$ and $E[u_{1it}\ u_{3it}] = 0$; these restrictions make sense because there is usually a lag of several months between the switch decision, the audit report and the bankruptcy outcome.

4.2. *Controlling for private information about the probability of bankruptcy*

This section describes how one can test whether audit reports or auditor switching signal valuable private information about the probability of bankruptcy. In eqs. (1)-(3) switching and audit reporting are allowed to depend on financial distress variables that are not publicly observable but are observed by the auditor (Z_{1it}) and the company (Z_{2it}). If this private information affects the switch decision or the auditor's report, the switch or report (which are publicly observable) may be a signal of financial distress. Since the Z_{1it} and Z_{2it} variables are unobserved by the statistician, one cannot directly test the null hypotheses that $\beta_2\gamma_{3S} = 0$, and $\beta_3\theta_4 = 0$. This section explains how one can indirectly test these hypotheses.

Eq. (4) replaces the unobservable Z_{1it} variable in eq. (2) with the bankruptcy dummy ($FAILS_{it}$).

$$Q_{Sit}^* = \gamma_{0S} + \gamma_{1S} X_{1it} + \gamma_{2S} X_{2it} + \gamma_{3S} Z_{1it} + u_{2Sit} \quad (2)$$

$$Q_{Sit}^* = \gamma_{0S} + \gamma_{1S} X_{1it} + \gamma_{2S} X_{2it} + \gamma_{4S} FAILS_{it} + v_{2Sit} \quad (4)$$

Under the null hypothesis that auditors' private information about the probability of bankruptcy does not affect audit reporting, $\beta_2\gamma_{3S} = 0$. If $\beta_2\gamma_{3S} = 0$, it must be true that

$E[FAILS_{it}\ v_{2Sit}] = 0$, implying that $\gamma_{4S} = 0$ in eq. (4). Intuitively, if an auditor's private information does not affect the audit reporting decision ($\beta_2\gamma_{3S} = 0$), the company's subsequent going-concern status should not help explain its audit report ($\gamma_{4S} = 0$). The alternative hypothesis is that an auditor is more likely to give a qualified report when there is private information indicating financial distress ($\beta_2\gamma_{3S} > 0$), and so a qualified report is a signal of financial distress ($\gamma_{4S} > 0$). Similarly, one can test whether the private information content of audit reports depends on whether the company is in the switching or non-switching state. If reports signal the same information in both states one would be unable to reject the null hypothesis that $\gamma_{41} = \gamma_{42}$. The alternative hypothesis is that audit reports have greater information content when they are issued by established incumbent auditors rather than new auditors ($\gamma_{41} < \gamma_{42}$).

In a similar way, one can investigate whether a switch is a signal of financial distress by replacing the unobserved Z_{2it} variable in eq. (3) with the bankruptcy dummy ($FAILS_{it}$).

$$SW_{it}^* = \theta_0 + \theta_1 (Q_{1it}^* - Q_{2it}^*) + \theta_2 X_{1it} + \theta_3 X_{3it} + \theta_4 Z_{2it} + u_{3it} \quad (3)$$

$$SW_{it}^* = \theta_0 + \theta_1 (Q_{1it}^* - Q_{2it}^*) + \theta_2 X_{1it} + \theta_3 X_{3it} + \theta_5 FAILS_{it} + v_{3it} \quad (5)$$

Under the null hypothesis that a switch is not a signal of financial distress, $\beta_3\theta_4 = 0$. If $\beta_3\theta_4 = 0$, it must be true that $E[FAILS_{it}\ v_{3it}] = 0$, implying that $\theta_5 = 0$ in eq. (5). Intuitively, if a company's private information about the probability of bankruptcy does not affect its switch decision ($\beta_3\theta_4 = 0$), the company's subsequent going-concern status should not help explain auditor switching ($\theta_5 = 0$). The alternative hypothesis is that companies are more likely to switch when they have unfavourable private information about the probability of bankruptcy ($\beta_3\theta_4 > 0$), and so a switch is a signal of financial distress ($\theta_5 > 0$).[16]

[16] An alternative way to test whether audit reports or switching signal valuable information about the probability of bankruptcy would be to include Q_{it} and SW_{it} as explanatory variables in the bankruptcy model. The results from doing this are qualitatively the same as those reported in this paper (Author, 1998).

4.3. *The reduced form model of auditor switching*

Previous research has shown that companies are more likely to switch auditor following qualified reports (Chow and Rice, 1982; Craswell, 1988; Citron and Taffler, 1992; Krishnan and Stephens, 1995). It can now be shown how this is consistent with the hypothesis that companies successfully engage in opinion-shopping ($\theta_1 < 0$). Substituting (4) into (5) gives the reduced form model of auditor switching (eq. (6)).

$$SW_{it}^{*} = \theta_0 + [\theta_1(\gamma_{11} - \gamma_{12}) + \theta_2]X_{1it} + \theta_1(\gamma_{21} - \gamma_{22})\, X_{2it} + [\theta_1(\gamma_{41} - \gamma_{42}) + \theta_6]FAILS_{it} + \theta_3 X_{3it} + v_{4it} \qquad \text{where} \quad v_{4it} = v_{3it} + \theta_1(v_{21it} - v_{22it}) \qquad (6)$$

The X_{2it} variables affect switching in the reduced form model (eq. (6)) through their effects on audit reporting - the X_{2it} variables do not affect switching in the structural model (eq. (5)). Without loss of generality, suppose that the only X_{2it} variable is lagged audit reports ($X_{2it} = Q_{it-1}$). A positive correlation between lagged audit reports and auditor switching $[\theta_1(\gamma_{21} - \gamma_{22}) > 0]$ can arise if companies engage in opinion-shopping ($\theta_1 < 0$), and if audit reporting is more persistent in the non-switching state than in the switching state ($\gamma_{21} < \gamma_{22}$). However, previous studies investigating the relationship between lagged reports and auditor switching failed to consider whether persistence in reporting differs in the switching and non-switching states.

Eq. (6) also shows that the financial distress variables (X_{1it} and $FAILS_{it}$) can explain switching in two ways. First, the relationship could reflect an opinion-shopping effect $[\theta_1(\gamma_{11} - \gamma_{12}) \neq 0$ and $\theta_1(\gamma_{41} - \gamma_{42}) \neq 0]$. Secondly, the relationship between financial health and auditor switching may have nothing to do with opinion-shopping $[\theta_2 \neq 0$ and $\theta_6 = 0]$; for example, failing companies may be more likely to switch because they are under greater pressure to obtain low-cost audit services. In contrast to previous research, this paper estimates a structural model of auditor switching to determine whether the relationship between financial health and switching reflects opinion-shopping behaviour.

4.4. *The structural model of auditor switching*

As well as estimating the reduced form switching model shown in eq. (6), this paper estimates a structural model. Eq. (7) replaces the unobservable Q_{1it}^{*} and Q_{2it}^{*} variables with their predicted values (Q_{1it}^{**} and Q_{2it}^{**}) - these are obtained by estimating audit reporting models for the switching and non-switching states.

$$SW_{it}^{*} = \theta_0 + \theta_1(Q_{1it}^{**} - Q_{2it}^{**}) + \theta_2 X_{1it} + \theta_3 X_{3it} + \theta_6\, FAILS_{it} + v_{5it} \qquad (7)$$

Equation (7) is identified because it does not include the X_{2it} variables that are in the audit reporting models (eq. (4)).[17] When estimating audit reporting models for the switching and non-switching states, it is necessary to control for the effects of self-selectivity. To show this, consider eq. (8) which is the reduced form model of switching shown in eq. (6).

$$SW_{it}^{*} = \alpha Z_{it} + v_{4it} \qquad (8)$$

where

$Z_{it} \equiv [1 : X_{1it} : X_{2it} : FAILS_{it} : X_{3it}]$ and

$\alpha \equiv [\theta_0 : \theta_1(\gamma_{11} - \gamma_{12}) + \theta_2 : \theta_1(\gamma_{21} - \gamma_{22}) : \theta_1(\gamma_{41} - \gamma_{42}) + \theta_6 : \theta_3]$.

Suppose the dependent variable in the audit reporting model (Q_{Sit}^{*}) is normally distributed.

$$Q_{Sit}^{*} \sim N[\gamma_{0S} + \gamma_{1S}\, X_{1it} + \gamma_{2S}\, X_{2it} + \gamma_{4S}\, FAILS_{it};\ \sigma_S^2] \qquad (S = 1, 2)$$

[17] Lagged audit reports (Q_{it-1}) are the X_{2it} variables used in this study. It shall be shown that lagged reports do not help identify failing companies in the bankruptcy model once the X_{1it} variables are controlled for. Theory indicates that lagged reports do not directly affect auditor switching in the structural model - they affect switching in the reduced form model if companies engage in opinion-shopping (Author, 1998).

where $\sigma^2 \equiv Var(v_{21it} - v_{22it})$

The reporting model in the switching state for companies that choose to switch is:

$$E[Q_{1it}^* \mid SW_{it} = 1] = \gamma_{01} + \gamma_{11} X_{1it} + \gamma_{21} X_{2it} + \gamma_{41} FAILS_{it} + p_1 \phi(\alpha Z_{it})[\Phi(\alpha Z_{it})]^{-1}$$

where $p_1 \equiv (\sigma_1^2 - \sigma_{12})/\sigma$ (9)

and $\phi(.)$ and $\Phi(.)$ are the normal density and normal distribution functions respectively.

The reporting model in the non-switching state for companies that choose not to switch is:

$$E[Q_{2it}^* \mid SW_{it} = 0] = \gamma_{02} + \gamma_{12} X_{1it} + \gamma_{22} X_{2it} + \gamma_{42} FAILS_{it} + p_2 \phi(\alpha Z_{it})[1 - \Phi(\alpha Z_{it})]^{-1}$$

where $p_2 \equiv (\sigma_2^2 - \sigma_{12})/\sigma$ (10)

Under the null hypothesis that companies do not engage in opinion-shopping, $\theta_1 = 0$. Since $v_{4it} = v_{3it} + \theta_1(v_{21it} - v_{22it})$, if companies do not engage in opinion-shopping ($\theta_1 = 0$) one would not expect to find evidence of self-selectivity ($p_1 = p_2 = 0$ in eqs. (9) and (10)). If self-selectivity is caused by opinion-shopping, one would expect to find that $p_1 + p_2 < 0$.[18] If $p_1 < 0$, companies that choose to switch have lower than average Q_{1it}^*; if $p_2 < 0$, companies that choose not to switch have lower than average Q_{2it}^*.

4.5. *Testing for omitted variables bias and heteroscedasticity in probit models*

All the models reported in this paper are tested for omitted variable bias and heteroscedasticity using the Lagrange Multiplier (LM) tests developed by Davidson and MacKinnon (1984). Eqs. (11) and (12) define the heteroscedastic probit model and the corresponding log-likelihood function where the variance of u_{it} is a function of X_{it}:

[18] See Maddala (1983) pp. 257-60

$$Y_{it}^* = \delta_1 X_{it} + u_{it} \qquad u_{it} \sim IN[0, \exp(2\delta_2 X_{it})] \qquad (11)$$

where $Y_{it} = 1$ if $Y_{it}^* \geq 0$

$Y_{it} = 0$ otherwise

$$\ln(L) = \Sigma_i Y_{it} \Phi[\delta_1 X_{it} \exp(-\delta_2 X_{it})] + \Sigma_i (1 - Y_{it})[1 - \Phi(\delta_1 X_{it} \exp(-\delta_2 X_{it}))] \qquad (12)$$

The heteroscedastic probit model becomes homoscedastic when $\delta_2 = 0$. For most models in this paper, the null hypothesis of homoscedasticity was rejected and so the results are reported for heteroscedastic probit models.

5. Estimation results

This section estimates bankruptcy, audit reporting and auditor switching models and tests the null hypotheses summarised in Table 7.

TABLE 7

Equations estimated and hypotheses tested

Bankruptcy model

$FAILS_{it}^* = \beta_0 + \beta_1 X_{1it} + u_{1it}$

Audit Reporting model

$Q_{it}^* = \gamma_0 + \gamma_1 X_{1it} + \gamma_2 X_{2it} + \gamma_4 FAILS_{it} + u_{2it}$

H_0 : Audit reports do not signal private information about the probability of bankruptcy ($\gamma_4 = 0$)

H_1 : A qualified report is a signal of financial distress ($\gamma_4 > 0$)

Reduced form model of auditor switching

$SW_{it}^* = \theta_0 + [\theta_1(\gamma_{11} - \gamma_{12}) - \theta_2]X_{1it} + \theta_1(\gamma_{21} - \gamma_{22}) X_{2it} + [\theta_1(\gamma_{41} - \gamma_{42}) + \theta_4]FAILS_{it} + \theta_3 X_{3it} + v_{4it}$

H_0 : A switch does not signal private information about the probability of bankruptcy $[\theta_1(\gamma_{41} - \gamma_{42}) + \theta_4 = 0]$

H_1 : A switch is a signal of financial distress $[\theta_1(\gamma_{41} - \gamma_{42}) + \theta_4 > 0]$

The explanatory variables used to estimate these models are the company size, industry-sector, profitability, cashflow, leverage, lagged audit report and agency cost variables described in section 3. It is necessary to identify which of these variables: identify failing companies (X_{1it}); explain audit reporting but do not help identify failing companies (X_{2it});

and, explain auditor switching but do not help identify failing companies or explain audit reporting (X_{3it}). This is done by starting with general bankruptcy, reporting and switching models before moving towards more parsimonious representations.

Table 8 presents the results for seven models. Models 1 and 2 are bankruptcy models; 3-5 are audit reporting models; 6 and 7 are reduced form switching models. For all seven models, the LM test statistics show no evidence of omitted variables bias. The null hypothesis of homoscedasticity was rejected in models 1-5 and 7 but not in model 6. Where evidence was found for heteroscedasticity, the variances in the error terms depended significantly on the gross cashflow variable (GCF_{it}).

Model 1 estimates the bankruptcy model including all the X_{1it}, X_{2it} and X_{3it} variables. The coefficients on the lagged audit report (Q_{it-1}) and agency cost variables ($LARGSH_{it}$ and $DIRSH_{it}$) are all insignificant - these variables do not belong to X_{1it} and are omitted from model 2. The coefficients on the remaining variables are all significant and so these variables belong to X_{1it}.

Models 1 and 2 show that bankruptcy is more likely to occur when the economy moves from boom to recession. The negative coefficient on the number of failing companies in the population (F_t) implies that a company is less likely to go bankrupt in the future if the economy is currently in a recession.[19] The coefficient on the CBI indicator of business confidence (CBI_t) is negative because it captures the effects of future economic conditions on the probability of bankruptcy (an increase in CBI_t implies that business confidence is improving). The signs on F_t and CBI_t show that a company is less (more) likely to fail over the next 12-18 months if the economy is currently in a recession (boom) and business conditions are expected to improve (worsen). Another important determinant of bankruptcy is company size. The coefficient on the number of employees (EMP_{it}) is negative showing

[19] The definitions for F_t and $FAILS_{it}$ mean that it is valid to include F_t as an explanatory variable. When predicting whether a company will fail *before* issuing its next set of accounts (i.e. in predicting whether $FAILS_{it} = 1$ or $FAILS_{it} = 0$), one is able to observe the number of companies *currently* entering bankruptcy.

that corporate failure is more likely if a company is small.[20] The industry dummies are also important - a company was more likely to enter bankruptcy if it operated in the construction sector ($D5_i$) or in the financial services sector ($D8_i$).[21] This reflects the fact that high interest rates during the 1990-2 recession badly affected the building industry. Moreover, in contrast to the 1979-81 recession, the 1990-2 recession badly hit the financial services sector. A company is also more likely to go bankrupt when it is suffering cashflow difficulties. The negative coefficient on the debtor-turnover ratio ($DBTN_{it}$) implies that a company is more likely to fail if it is having problems receiving payment from debtors. Similarly, the negative coefficient on the cash ratio ($CASHRAT_{it}$) indicates that companies are more likely to fail if cash reserves are low. Leverage is also an important determinant of bankruptcy; the positive coefficient on capital gearing ($CAPG_{it}$) shows that a company is more likely to fail when leverage is high. The negative coefficient on the return on capital variable (ROC_{it}) implies that a company is more likely to fail when profitability is low.

Audit reporting models 3-5 are estimated under the restriction that the coefficients are the same in the switching and non-switching states (the dependent variable is Q_{it}^* rather than QS_{it}^*). This is done because the small number of auditor switches mean that it is impossible to estimate very general audit reporting models in the switching state due to degrees of freedom problems. However, the aim of this section is to determine which variables affect audit reporting (i.e. which variables belong to X_{1it} and X_{2it}). A comparison of reporting in the switching and non-switching states is undertaken in section 5.2 using the derived parsimonious specification (model 5).

[20] It might be argued that company size can affect the probability of bankruptcy because large companies tend to be more highly diversified and are therefore less vulnerable to sector-specific shocks. To investigate this, a variable capturing the number of industry sectors in which each company had a main activity was included in the model. No evidence was found to suggest that the degree of diversification affected the probability of bankruptcy. Other measures of company size such as the value of total assets were found to have similar effects as the EMP_{it} variable.

[21] Industry sectors with insignificant effects are omitted from Table 8. $Dj = 1$ if company i operates in an industry for which the first digit SIC code is j.

TABLE 8

Models of bankruptcy, audit reporting and auditor switching
(z-statistics in parentheses)

	BANKRUPTCY MODELS		*AUDIT REPORTING MODELS*			*REDUCED FORM SWITCHING MODELS*	
Dependent variable	$FAILS_{it}^*$	$FAILS_{it}^*$	Q_{it}^*	Q_{it}^*	Q_{it}^*	SW_{it}^*	SW_{it}^*
Explanatory Variables	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*	*Model 7*
F_t	-0.016	-0.015	-0.001	-0.003e-01	.	-0.003e-02	
	(-3.873)	(-3.656)	(-0.185)	(-0.074)	.	(-0.011)	.
CBI_t	-0.029	-0.029	-0.002	-0.001	.	0.003	
	(-6.302)	(-6.754)	(-0.647)	(-0.285)	.	(1.173)	.
EMP_{it}	-0.416e-04	-0.448e-04	-0.086e-04	-0.078e-04	.	-0.080e-04	.
	(-2.262)	(-2.395)	(-1.270)	(-1.180)	.	(-2.052)	.
$D1_i$	0.406	0.456	0.082	0.069	.	-0.416	.
	(1.620)	(1.867)	(0.347)	(0.286)	.	(-1.429)	.
$D5_i$	0.413	0.361	-0.076	-0.090	.	0.022	.
	(3.021)	(2.699)	(-0.507)	(-0.601)	.	(0.216)	.
$D8_i$	0.399	0.372	0.005	-0.026	.	-0.019	.
	(3.569)	(3.436)	(0.043)	(-0.222)	.	(-0.244)	.
$DBTN_{it}$	-0.219e-03	-0.210e-03	-0.014e-03	-0.012e-03	.	0.318e-04	.
	(-1.684)	(-1.754)	(-0.307)	(-0.258)	.	(2.144)	.
$CASHRAT_{it}$	-0.271e-02	-0.413e-02	-0.075e-02	-0.072e-02	.	-0.138e-02	.
	(-1.382)	(-2.009)	(-0.697)	(-0.672)	.	(-1.835)	.
GCF_{it}	1.391e-02	.	-0.356e-02	-0.341e-02	.	0.392e-02	.
	(1.329)	.	(-0.403)	(-0.386)	.	(0.331)	.
$CAPG_{it}$	0.121e-03	0.118e-03	0.109e-03	0.104e-03	0.106e-03	0.080e-04	.
	(7.699)	(8.207)	(7.787)	(7.306)	(8.148)	(0.615)	.
ROC_{it}	-0.794e-05	-0.306e-04	-0.107e-03	-0.103e-03	-0.120e-03	-0.077e-04	.
	(-2.130)	(-1.504)	(-2.703)	(-2.637)	(-4.276)	(-0.307)	.
$FAILS_{it}$	.	.	.	0.512	0.399	0.416	0.377
	.	.	.	(2.476)	(2.077)	(2.038)	(2.169)
Q_{it-1}	0.193	.	1.539	1.540	1.553	0.697	0.658
	(0.762)	.	(11.418)	(11.387)	(12.150)	(4.677)	(4.731)
$DIRSH_{it}$	-0.522e-02	.	0.160e-02	0.180e-02	.	0.367e-02	0.447e-02
	(-1.219)	.	(0.697)	(0.781)	.	(2.348)	(3.137)
$LARGSH_{it}$	-0.042e-02	.	0.043e-02	0.073e-02	.	0.509e-02	0.505e-02
	(-0.153)	.	(0.135)	(0.231)	.	(2.386)	(2.610)
CONSTANT	-2.109	-2.180	-2.239	-2.259	-2.314	-1.852	-1.864
	(-10.872)	(-13.164)	(-13.871)	(-13.915)	(-24.588)	(-16.285)	(-28.844)
Heteroscedasticity							
GCF_{it}	-0.012	-0.008	-0.013	-0.013	-0.013	-0.866e-02	-0.860e-02
	(-3.095)	(-2.696)	(-3.219)	(-3.139)	(-3.605)	(-3.351)	(-3.967)
LM	0.563	0.358	1.652	1.670	0.553	0.019	1.353
$\chi^2_{0.05}$	24.996	18.307	24.996	26.296	9.488	24.996	9.488
Observations	5441	6363	5441	5441	5822	5439	5856

Notes
1. $D1_i$ = 1 if company i operates in energy and water sector; = 0 otherwise.
2. $D5_i$ = 1 if company i operates in construction sector; = 0 otherwise.
3. $D8_i$ = 1 if company i operates in financial services sector; = 0 otherwise.
4. EMP_{it} = Number of employees (Company size measure).
5. $DBTN_{it}$ = Turnover-debtor ratio (Cash-flow measure).
6. $CASHRAT_{it}$ = Cash-ratio (Cash-flow measure).
7. GCF_{it} = Gross cash-flow ratio (Cash-flow measure).
8. $CAPG_{it}$ = Capital gearing (Leverage measure).
9. ROC_{it} = Return on capital ratio (Measure of profitability).
10. $FAILS_{it}$ = 1 if company i issues its final annual report in year t prior to entering bankruptcy; = 0 otherwise.
11. Q_{it-1} = 1 if company i received a qualified report in year t-1; = 0 otherwise.
12. $DIRSH_{it}$ = Ordinary shareholdings of directors.
13. $LARGSH_{it}$ = Ordinary shareholdings of other large shareholders.

Model 3 includes all the X_{1it}, X_{2it} and X_{3it} variables. From the set of X_{1it} variables, only profitability (ROC_{it}) and leverage ($CAPG_{it}$) significantly affect audit reporting - auditors are more likely to qualify the reports of companies that have low profitability and are highly leveraged.

In models 4 and 5, the significantly positive coefficients on the bankruptcy dummy ($FAILS_{it}$) indicate that one can reject the null hypothesis that reports are unaffected by auditors' private information about the probability of bankruptcy. When an auditor observes private information indicating that the company is in financial distress, the auditor is more likely to give a qualified report ($\gamma_4 > 0$).[22]

In models 3-5, the coefficients on lagged reports (Q_{it-1}) are positive and highly significant indicating that there are strong persistence effects in audit reporting.[23] One can be confident that the Q_{it-1} variable is not picking up the effects of financial distress, since the coefficient on Q_{it-1} is insignificant in the bankruptcy model.

In models 3 and 4, the coefficients on the agency cost variables ($LARGSH_{it}$ and $DIRSH_{it}$) are insignificant, indicating that these variables do not belong to X_{2it}. Model 5 only contains variables that have significant effects on audit reporting and is the preferred specification for the audit reporting model.

Models 6 and 7 are reduced form models of auditor switching. Model 6 shows that the coefficients on the financial distress variables (X_{1it}) are insignificant in explaining auditor switching. Model 7 omits variables with insignificant effects and is the preferred specification for the reduced form switching model. The coefficients on the bankruptcy

[22] It can be shown that the bankruptcy models have lower type I and type II error rates compared to audit reports (Author, 1998). Whilst the private information of auditors tends to increase the accuracy of audit reports, audit reports do not fully reflect publicly available information about the probability of bankruptcy (the coefficients on the X_{1it} variables are significantly different for the bankruptcy and audit reporting models), and there is persistence in audit reporting despite the fact that lagged audit reports (Q_{it-1}) do not help to predict bankruptcy. Hence, audit reports are relatively noisy indicators of bankruptcy.

[23] To investigate whether serial correlation causes inconsistent standard errors for the coefficients on lagged audit reports (Q_{it-1}), a probit model was estimated with robust standard errors. The results were similar to those reported in Table 8

dummy ($FAILS_{it}$) are positive and (just) significant. Consistent with previous research, this means that a switch is a signal of financial distress $[\theta_1(\gamma_{41} - \gamma_{42}) + \theta_6 > 0]$.

The coefficients on the agency cost variables ($DIRSH_{it}$ and $LARGSH_{it}$) are significantly positive. This is consistent with the argument that companies with high agency costs prefer not to switch auditor because a switch is a signal of financial distress. Since the agency cost variables have insignificant effects in the bankruptcy and audit reporting models, they belong to X_{3it}.

The highly significant positive coefficients on lagged reports (Q_{it-1}) in models 6 and 7 indicate that companies are more likely to switch following qualified reports. Since the Q_{it-1} variable has significant effects on audit reporting and auditor switching, it belongs to X_{2it}. Section 4.3 showed that this positive relationship $[\theta_1(\gamma_{21} - \gamma_{22}) > 0]$ could occur if audit reporting is less persistent in the switching state than in the non-switching state ($\gamma_{21} < \gamma_{22}$), and if companies engage in opinion-shopping ($\theta_1 < 0$). Section 5.2 tests whether companies engage in opinion-shopping by estimating audit reporting models in the switching and non-switching states and by estimating the structural switching model.

5.2. *The structural model of auditor switching*

This section estimates parsimonious audit reporting models for the switching and non-switching states, and estimates the structural model of auditor switching. The equations estimated, and the hypotheses tested are summarised in Table 9.

TABLE 9

Equations estimated and hypotheses tested

Audit Reporting model in the switching state

$E[Q_{1it}^* \mid SW_{it} = 1] = \gamma_{01} + \gamma_{11} X_{1it} + \gamma_{21} X_{2it} + \gamma_{41} FAILS_{it} + p_1 \phi(\alpha Z_{it})[\Phi(\alpha Z_{it})]^{-1}$

H_0 : Audit reports do not signal private information about the probability of bankruptcy ($\gamma_{41} = 0$)

H_1 : A qualified report is a signal of financial distress ($\gamma_{41} > 0$)

H_0 : There are no self-selectivity effects ($p_1 = 0$)

H_1 : Self-selectivity effects are caused by opinion-shopping ($p_1 < 0$)

Audit Reporting model in the non-switching state

$E[Q_{2it}^* \mid SW_{it} = 0] = \gamma_{02} + \gamma_{12} X_{1it} + \gamma_{22} X_{2it} + \gamma_{42} FAILS_{it} + p_2 \phi(\alpha Z_{it})[1 - \Phi(\alpha Z_{it})]^{-1}$

H_0 : Audit reports do not signal private information about the probability of bankruptcy ($\gamma_{42} = 0$)

H_1 : A qualified report is a signal of financial distress ($\gamma_{42} > 0$)

H_0 : There are no self-selectivity effects ($p_2 = 0$)

H_1 : Self-selectivity effects are caused by opinion-shopping ($p_2 < 0$)

H_0 : A switch has no effect on the conservatism of audit reports ($\gamma_{01} = \gamma_{02}$)

H_1 : A switch increases the probability of a qualified report ($\gamma_{01} > \gamma_{02}$)

Structural model of auditor switching

$SW_{it}^* = \theta_0 + \theta_1 (Q_{1it}^{**} - Q_{2it}^{**}) + \theta_2 X_{1it} + \theta_3 X_{3it} + \theta_6 FAILS_{it} + v_{5it}$

H_0 : Companies do not successfully engage in opinion-shopping ($\theta_1 = 0$)

H_1 : Companies do successfully engage in opinion-shopping ($\theta_1 < 0$)

H_0 : A switch does not signal private information about the probability of bankruptcy once one controls for opinion-shopping ($\theta_6 = 0$)

H_1 : A switch is a signal of financial distress once one controls for opinion-shopping ($\theta_6 > 0$)

Models 3-5 from Table 8 showed that the main determinants of audit reporting are leverage ($CAPG_{it}$), profitability (ROC_{it}), lagged audit reports (Q_{it-1}) and auditors' private information ($FAILS_{it}$). These variables are therefore included in the audit reporting models. The inverse Mill's ratios ($\phi(\alpha Z_{it})[\Phi(\alpha Z_{it})]^{-1}$ and $\phi(\alpha Z_{it})[1-\Phi(\alpha Z_{it})]^{-1}$) are constructed from model 7 of table 8.

Models 1-4 from Table 10 are audit reporting models estimated in the switching and non-switching states.[24] Models 1 and 3 are estimated for observations in which a switch occurred (eq. (9)); models 2 and 4 are estimated for observations in which no switch occurred (eq. (10)). Models 1 and 2 control for the effects of self-selectivity by including the inverse Mill's ratios, whilst models 3 and 4 impose the restriction that there are no self-selectivity effects ($p_1 = p_2 = 0$).

[24] The reporting and switching models are estimated using the two-stage approach which gives consistent coefficient estimates. In a simultaneous switching system with two binary dependent variables, a formula for the variance-covariance matrix appears to be unknown. In any case, the validity of such a formula would depend on the distributional assumptions for Q_{3it}^* and so there may be little gain in efficiency from developing simultaneous estimation techniques. To ensure consistent standard errors, robust standard errors were calculated (Huber, 1967).

Models 1-4 show that a company is more likely to receive a qualified report when profitability (ROC_{it}) is low and leverage ($CAPG_{it}$) is high - this is consistent with the reporting models estimated in section 5.1.

The coefficients on the bankruptcy dummy ($FAILS_{it}$) are significant in models 2 and 4 but insignificant in models 1 and 3 ($\gamma_{41} = 0$; $\gamma_{42} > 0$). Private information about the probability of bankruptcy is more likely to affect the report of an established incumbent auditor than a new auditor. This is important because it suggests that a policy of compulsory auditor switching, aimed at reducing the ability of managers to engage in opinion-shopping, could have counter-productive effects in terms of reducing the informativeness of audit reports.

In models 1 and 2, the intercept is higher for companies that choose to switch ($\gamma_{01} > \gamma_{02}$). Although this difference is not highly significant, it is consistent with the argument that a switch can exogenously increase the probability of a qualified report if the switch is a signal of financial distress (Author, 1998). The lack of significance should not be surprising given that a switch is only a weak signal of financial distress.

In models 1 and 2, the coefficients on the inverse Mill's ratios ($\phi(\alpha Z_{it})[\Phi(\alpha Z_{it})]^{-1}$ and $\phi(\alpha Z_{it})[1-\Phi(\alpha Z_{it})]^{-1}$) are negative which is consistent with the view that self-selectivity effects are caused by opinion-shopping. However, since these coefficients are not statistically significant, one cannot reject the null hypothesis that there are no self-selectivity problems ($\rho_1 = \rho_2 = 0$) - this restriction is imposed in models 3 and 4.

TABLE 10

Models of audit reporting in the switching and non-switching states and structural models of auditor switching (z-statistics in parentheses)

	AUDIT REPORTING MODELS IN THE SWITCHING AND NON-SWITCHING STATES				*STRUCTURAL SWITCHING MODELS*	
State	*S = 1*	*S = 2*	*S = 1*	*S = 2*		
Dependent variable	Q_{1it}^*	Q_{2it}^*	Q_{1it}^*	Q_{2it}^*	SW_{it}^*	SW_{it}^*
Explanatory variables	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
$CAPG_{it}$	0.187e-03	0.108e-03	0.219e-03	0.099e-03	0.729e-04	0.662e-04
	(2.866)	(6.368)	(3.611)	(7.280)	(4.399)	(4.224)
ROC_{it}	-0.141e-03	-0.122e-03	-0.162e-03	-0.116e-03	-0.283e-04	-0.268e-04
	(-1.383)	(-3.848)	(-1.772)	(-3.837)	(-1.568)	(-1.568)
$FAILS_{it}$	-0.447	0.662	0.201	0.430	0.316	0.294
	(-0.602)	(2.447)	(0.328)	(2.121)	(1.690)	(1.561)
Q_{it-1}	-0.806	2.067	0.291	1.706	.	.
	(-0.930)	(5.683)	(0.651)	(12.574)	.	.
$\frac{\phi(\alpha Z_{it})}{\Phi(\alpha Z_{it})}$	-2.057	.	.	.	.	.
	(-1.488)	.	.	.	.	.
$\frac{\phi(\alpha Z_{it})}{1-\Phi(\alpha Z_{it})}$	.	-1.758	.	.	.	.
	.	(-0.961)	.	.	.	.
$(Q_{1it}^{**} - Q_{2it}^{**})$			.	.	-0.515	-0.486
	.	.	.	.	(-4.783)	(-4.721)
$DIRSH_{it}$	.	.	.	.	1.028e-02	0.479e-02
		.	.	.	(5.532)	(3.316)
$LARGSH_{it}$	.	.	.	.	1.191	0.512e-02
	.	.	.	.	(4.919)	(2.599)
CONSTANT	1.711	-2.195	-2.803	-2.290	-2.432	-2.148
	(0.564)	(-15.278)	(-6.154)	(-23.478)	(-16.922)	(-20.974)
Heteroscedasticity						
GCF_{it}	-0.503e-02	-1.352e-02	-0.012	-0.014	-0.765e-02	-0.778e-02
	(-0.213)	(-3.472)	(-0.098)	(-3.572)	(-2.641)	(-2.742)
LM	0.122	0.510	0.060	0.557	1.017	0.022
$\chi^2_{0.05}$	11.070	11.070	9.488	9.488	12.592	12.592
Observations	211	5540	211	5607	5751	5751

Notes

$FAILS_{it}$ = 1 if company i issues its final annual report in year t prior to entering bankruptcy; = 0 otherwise

GCF_{it} = Gross cash-flow ratio (Cash-flow measure).

$CAPG_{it}$ = Capital gearing (Leverage measure).

ROC_{it} = Return on capital ratio (Measure of profitability)

Q_{it-1} = 1 if company i received a qualified report in year t-1, = 0 otherwise

$DIRSH_{it}$ = Ordinary shareholdings of directors

$LARGSH_{it}$ = Ordinary shareholdings of other large shareholders

$\phi(\alpha Z_{it})[\Phi(\alpha Z_{it})]^{-1}$ = Inverse Mill's ratio for the switching state (derived from model 7 of Table 8).

$\phi(\alpha Z_{it})[1-\Phi(\alpha Z_{it})]^{-1}$ = Inverse Mill's ratio for the non-switching state (derived from model 7 of Table 8)

$(Q_{1it}^{**} - Q_{2it}^{**})$ = Opinion-shopping variable (derived from models 1-4 of Table 10).

The coefficients on lagged audit reports (Q_{it-1}) in models 1-4 indicate that audit reporting is highly persistent in the non-switching state but is not persistent in the switching state ($\gamma_{21} < \gamma_{22}$). The reduced form switching model showed that companies are much more likely to switch following qualified reports $[\theta_1(\gamma_{21} - \gamma_{22}) > 0]$. Therefore, one would expect to find that companies engage in opinion-shopping ($\theta_1 < 0$) in the structural switching model. Having estimated audit reporting models for the switching and non-switching states, the results are used to generate the opinion-shopping variable ($Q_{1it}^{**} - Q_{2it}^{**}$), so that the structural switching model (eq. (7)) can be estimated.

Section 5.1 showed that none of the X_{1it} variables had significant effects in the reduced form switching model (model 6 from Table 8). However, the profitability (ROC_{it}) and leverage ($CAPG_{it}$) variables had significant effects on audit reporting (models 3-5 from Table 8). Eq. (6) shows that the insignificant effects of ROC_{it} and $CAPG_{it}$ in the reduced form model could arise if the direct effect of financial health on switching (θ_2) offsets the indirect opinion-shopping effect ($\theta_1(\gamma_{11} - \gamma_{12})$). The ROC_{it} and $CAPG_{it}$ variables should be included in the structural switching model, because once the opinion-shopping effect is controlled for they could have significant direct effects on auditor switching. The coefficients on the agency cost variables ($DIRSH_{it}$ and $LARGSH_{it}$) and the bankruptcy dummy ($FAILS_{it}$) were significant in the reduced form switching models (models 6 and 7 from Table 8). Therefore, these variables are also included in the structural model.

The key restriction in estimating the structural model is that lagged reports (Q_{it-1}) do not directly affect auditor switching. As explained in section 2, theory suggests that lagged reports affect auditor switching because persistence in reporting differs in the switching and non-switching states - lagged reports only affect switching through their effects on audit reporting (Author, 1998). This theoretical restriction means that the structural model is just identified and allows the coefficient on the opinion-shopping variable ($Q_{1it}^{**} - Q_{2it}^{**}$) to be estimated.

Models 5 and 6 from Table 10 show the results from estimating the structural switching model. In model 5, the opinion-shopping variable ($Q_{1it}^{**} - Q_{2it}^{**}$) is constructed from models 1 and 2 which controlled for self-selectivity; in model 6, the opinion-shopping

variable ($Q_{1it}^{**} - Q_{2it}^{**}$) is constructed from models 3 and 4 which impose the restriction of no self-selectivity effects ($\rho_1 = \rho_2 = 0$). The results for models 5 and 6 are very similar reflecting the finding that self-selectivity effects are insignificant in the audit reporting models.

The coefficients on the profitability (ROC_{it}), leverage ($CAPG_{it}$) and bankruptcy ($FAILS_{it}$) variables indicate that a switch is more likely to occur when companies are in financial distress - however, the coefficients on $FAILS_{it}$ and ROC_{it} are not statistically significant. The coefficients on the agency cost variables ($DIRSH_{it}$ and $LARGSH_{it}$) are positive and highly significant indicating that switching is less likely to occur when agency costs are high. This is consistent with the argument made for the reduced form model - companies with high agency costs are less likely to switch because of the adverse signalling effects.

The key difference between the reduced form and structural switching models is the inclusion of the opinion-shopping variable ($Q_{1it}^{**} - Q_{2it}^{**}$) in place of the lagged audit report variable (Q_{it-1}). The highly significant negative coefficients on the opinion-shopping variable mean that one can strongly reject the null hypothesis that companies do not engage in opinion-shopping ($\theta_1 = 0$) against the alternative hypothesis that companies successfully engage in opinion-shopping ($\theta_1 < 0$).

5. Conclusions and policy implications

The evidence from this paper strongly supports the view that companies successfully engage in opinion-shopping. This conclusion differs from previous studies that failed to control for the reports that companies would have received had they made different switch decisions. Audit reporting is much less persistent in the switching state than in the non-switching state. Therefore, companies that engage in opinion-shopping tend to switch auditors who give qualified reports and retain auditors who give unqualified reports. The fact that previous studies found the same relationship between lagged reports and auditor switching suggests that the opinion-shopping phenomenon is not unique to the data used in this study. Opinion-shopping reduces the conservatism of audit reports (raising P*), which implies a higher type I error rate and lower type II error rate. Whether or not this is in investors' interests depends on the relative costs of type I and type II errors. One avenue for future research is to try to ascertain these costs so as to give policy-makers guidance as to whether it is desirable to increase or reduce the conservatism of audit reports.

The evidence also indicates that a switch is a (weak) signal of financial distress and that switching may exogenously increase the conservatism of audit reports - however, this result was not statistically significant.

Finally, the evidence indicates that switching exogenously reduces the accuracy of reports. Audit reports are more accurate indicators of financial distress when they are issued by established incumbent auditors rather than new auditors. The policy conclusion of this paper is that the UK government may have acted wisely in rejecting the EC proposal to introduce compulsory auditor switching. Whilst such a proposal may have increased the conservatism of audit reports by reducing the scope for opinion-shopping (thereby reducing the type I error rate and raising the type II error rate), it may have also reduced the overall accuracy of reports by replacing established incumbent auditors with less well-informed new auditors (thereby raising both the type I and type II error rates). This is consistent with other evidence indicating that it takes time for newly appointed auditors to become familiar with clients (St. Pierre and Anderson, 1984).

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