

# Determinants of Audit Reports in the UK

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# Determinants of Audit Reports in the UK

## Abstract

This paper investigates the determinants of audit reports on public and private companies in the UK. The main empirical findings show that listed companies are less likely to receive non-going-concern related modifications than other companies (private or public but not listed), but otherwise company type is insignificant in determining audit modifications. Furthermore, the determinants of modified audit reports differ between public and private companies and between different types of audit modification. In particular, high levels of financial gearing are associated with a significantly decreased (increased) likelihood of non-going-concern related modifications on private (public) companies.

# Determinants of Audit Reports in the UK

## 1. Introduction

This paper provides evidence of the association between different types of audit modifications and observable company characteristics, in both public and private limited UK companies.

Previous research in this area is limited to a handful of papers, although models of audit reporting also occur in some studies of bankruptcy prediction (e.g. Lennox, 1999). Studies are limited to particular types of companies. For example, Dopuch et al. (1987) estimated a model of audit reporting in listed US companies and Keasey et al. (1988) estimated a model of audit reporting in small, private UK companies. This paper extends the literature by comparing the determinants of audit opinions in both public and private companies. This is not possible with US data as most non-listed companies in the US do not have external financial audits.

Dopuch et al. (1987) estimated a probit model of audit qualification in companies listed on the New York and American Stock Exchange, which they propose would be of value both to auditors and to academic researchers. Auditors would

be able to screen potential clients by using such a model to identify those that are likely to receive qualified audit opinions, or they could use the model to provide a benchmark representing the probability that a ‘typical’ auditor would issue a qualified audit opinion on a given company. Such a benchmark would be of use in peer review and court cases dealing with auditor negligence. Researchers would be able to use a model which predicted audit opinions to assess the extent to which markets expect a qualified audit opinion to be issued. There is potential for the models reported in this paper to be applied in a similar manner to UK companies.

This paper will primarily extend the literature by directly comparing audit reporting on public and private companies. As discussed in section 2.2 below, public (listed) companies may be more or less likely to receive modified audit opinions than private companies, and it is also possible that the determinants of modified opinions may vary between the different company types. In addition, this paper compares the determinants of different types of audit reports to identify differences in the factors leading to the disclosure of going-concern related fundamental uncertainties and those leading to disagreement or limitation on scope type modifications<sup>2</sup>.

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<sup>2</sup>Audit modifications are defined as any audit report other than a standard clean report.

The analysis of audit reporting in public and private companies is conducted in two parts. Firstly, a logistic model of audit reporting, with the dependent variable taking the value one if the company receives any kind of modified audit report, and zero otherwise, is estimated separately on public and private companies. This is to assess whether public companies are significantly more or less likely to receive modified audit reports than private companies and whether the determinants of audit modification *per se* differ between the two company types.

Secondly, a multinomial model which distinguishes between different types of audit modifications is estimated separately on public and private companies, to determine whether the determinants of those audit reports differ between different company types and different audit opinions. The dependent variable in this model takes the value two if the company receives a going-concern related modification, one if the company receives any other audit modification, and zero otherwise.

Section 2 outlines the major differences between public and private companies in the UK. Section 3 describes the logistic and multinomial logistic models of audit modification. Section 4 describes the data collection, transformations of the variables, and descriptive statistics. Section 5 contains the results of the

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This definition includes audit reports featuring explanatory paragraphs describing fundamental uncertainties related to going concern issues. Other audit modifications typically deal with disagreements over accounting treatment or disclosure, or with lack of available audit evidence (limitations on scope).

estimations. A discussion of the results and potential implications, together with a summary of the main conclusions, is presented in section 6.

## **2. Public and Private Limited Companies in the UK**

A company which is limited by shares (where the liability of the members - shareholders - is limited to the amount unpaid on the shares that they hold) may be either public or private, and this fact must be indicated in the company's name and in its memorandum of association. Public companies must comply with stricter legislation under the Companies Acts governing such matters as the minimum numbers of directors and members, minimum amounts of issued and authorised share capital, and filing deadlines; however they have more ready access to finance as they are allowed to issue shares to the public through a recognised stock exchange. Public companies may also advertise any of the company's securities for sale to the public. In contrast, private companies may not sell shares or advertise the sale of securities to the public.

The major differences between public and private companies are summarised in table 2.1<sup>3</sup>.

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<sup>3</sup>For the companies included in this study, the general requirements that a private company must meet to qualify for audit exemption are: that the company must qualify as 'small' for the purposes of filing abbreviated accounts, must have turnover of no more than £350,000, and total

<b>Company Type:</b>	<b>Private</b>	<b>Public</b>
Minimum number of members	1	2
Minimum number of directors	1	2
Company secretary	1, no formal qualifications	1, suitably qualified
Minimum authorised share capital	-	£50,000
Minimum issued share capital	-	£50,000
Minimum paid up share capital	-	1/4 of nominal value of each allotted share plus the whole of any premium
Filing deadline for annual accounts	10 months	7 months
Audit exemption available for companies meeting certain requirements?	Yes	No
Access to capital markets	May not sell shares to the general public	May sell shares to the general public

Table 2.1: Differences Between Public and Private Companies

## 2.1. Listed Companies

Public companies may be listed by becoming members of a recognised stock exchange (private companies may not be listed because they are not permitted to sell shares to the general public). In the UK these consist, for the data analysed here, of the main market on the London Stock Exchange, and the Alternative Investments Market (AIM), which caters for younger, growing companies. In order to become a member of the main London Stock Exchange a company must,

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assets of no more than £1.4 million, although additional restrictions apply to certain types of company where there is deemed to be a public interest. At the time of writing, the turnover limit has recently been raised to £1 million and there are indications that it may be further raised to the maximum currently allowed under EU law, namely £4.8 million.

among other requirements, have a total market capitalisation of at least £700,000 (usually larger) and, after the listing, have at least 25% of its share capital in public hands.

Once a company has become a member it must continue to meet obligations concerning the timely and accurate disclosure of any price-sensitive information (such as a significant change in the company's financial position or outlook, or a major new development) to the market as a whole at the same time, greater disclosure of directors' activities, and restrictions on directors' share dealing, in addition to filing annual audited accounts within six months of the accounting year end, (unaudited) half-yearly figures within four months of the half-year date, and maintaining a minimum of 25% share ownership in public hands. Significant changes in any substantial shareholdings must also be disclosed.

## **2.2. Audit Implications**

Because of the regulatory differences between private and public companies, and between listed and non-listed companies, one might expect to find differences in the frequency and determinants of modified audit reports between these classes of companies.

Listed companies are under closer public scrutiny than other companies, which



may increase the amount of audit work performed, or the conservatism of the subsequent audit reports, if this increases the risk that an auditor may be sued if the audit report fails to disclose a material error or omission or to highlight fundamental uncertainties where they exist. This might increase the frequency of modified audit reports. However, listed companies are also likely to have greater financial resources and prestige which may increase threats to auditor independence, and reduce the frequency of modified audit reports. Listed companies may also have lower going-concern risk and better quality accounting functions than other companies, which may further reduce the frequency of audit modifications. Finally, listed companies must disclose more frequent and detailed financial information, which may improve the auditor's knowledge of the client.

Public companies (whether listed or not) may be viewed similarly in comparison with private companies, although the distinctions between public and private companies may not be so clear in all cases. For example, some large private companies may share features such as closer public scrutiny with some public or listed companies, and some small public companies may share features such as close involvement in management by owners with some private companies. However, private companies are distinguished in law and, given the relatively small population of listed companies, the public/private distinction used in this study is more

appropriate than a listed/non-listed distinction, given that listing will be included as an explanatory variable.

Listed companies are generally larger than non-listed companies, and public companies generally larger than private companies, and size (which has an obvious relationship with the quantity and complexity of account balances and transactions, but which may also be related to the quality of systems of internal controls and the accounting function) may also be a leading factor determining audit modification. Company size and type may also determine the type of audit firm chosen, and there may be differences in audit quality between audit firms which affect reported audit opinions. Differences in the financial structures of listed, public and private companies (due to size of asset base and differing degrees of access to the financial markets) may also influence the determinants of audit reports, as some variables may be more likely to be material in the auditor's eyes (have sufficiently large mean values to significantly influence readers of the accounts) in certain types of company.

The type of company may therefore be a significant factor in understanding the determinants of audit reports.

### 3. The Models

The models estimated in this paper are logistic models of the general form:

$$\Pr(\text{MOD}_t = 1) = \frac{e^{\beta'X}}{1 + e^{\beta'X}} = \Lambda(\beta'X)$$

where ‘MOD<sub>t</sub>’ is a dummy variable indicating whether or not a company received a modified audit report on the most recent set of financial statements (MOD = 1 if the report was modified, MOD = 0 otherwise), and multinomial logistic models of the general form:

$$\Pr(Q_t = 0) = \frac{1}{1 + \sum_{k=1}^5 e^{\beta'_k X}}$$
$$\Pr(Q_t = j) = \frac{e^{\beta'_j X}}{1 + \sum_{k=1}^2 e^{\beta'_k X}} \text{ for } j = 1, 2$$

where ‘Q<sub>t</sub>’ is a variable indicating the type of audit report on the most recent set of financial statements (Q<sub>t</sub> = 0 if the report was not modified in any way - i.e. clean report, 2 if the report was related to going concern uncertainties, and 1 otherwise).

$X$  is a vector of company-specific explanatory variables, and  $\beta$  are the corresponding coefficients to be estimated.  $\Lambda$  is the logistic cumulative distribution function.

Four models are estimated. The first two are logistic models; the first model is estimated over private companies only and the second is estimated over public companies only. The latter two are multinomial logistic models; the first model is estimated over private companies only and the second is estimated over public companies only. This split was chosen rather than a split between listed and non-listed companies primarily as there are too few listed companies in the data ( listed companies comprise just 4% of the final estimation sample - see sections 4 and 4.1).

### **3.1. Choice of Explanatory Variables**

A full list of the explanatory variables included in the models is given in table 3.1. With the exception of the lagged audit report variables and the listed company dummy, all variables are included in all the models. Note that time subscripts for the financial statements to which the variables relate have not been included as all variables relate to the most recent set of accounts, except for the variables describing lagged audit reports, and the loss dummy which relates to both the

<b>Variable Name</b>	<b>Description</b>
MOD <sub>t-1</sub>	dummy variable indicating whether the audit report on the prior set of accounts is modified (models one and two)
Q <sub>t-1</sub>	variable indicating type of audit report on the prior set of accounts (models three and four)
totass	total assets
subsid	dummy variable indicating whether the company is a subsidiary
quick	quick ratio (current assets excl. stock / current liabilities)
gear	financial gearing (long-term debt / capital employed)
loss	dummy variable indicating that a loss was made in the current or prior year
cont	contingent liabilities
big	dummy variable indicating whether the auditor is a 'big-six' firm
fee	total auditor's fees (audit and non-audit)
lag	number of days between the year end and the filing of accounts
list	dummy variable indicating whether the company is listed on a UK stock exchange (AIM or the main London Stock Exchange)

Table 3.1: Explanatory Variables in Models of Audit Modification

current and prior year.

### 3.1.1. Size and Ownership Variables

Company size may be important in audit reporting as larger companies have better accounting functions than smaller companies, which may reduce the need for disagreement-type audit modifications, as well as greater asset bases on which to secure loans, and greater market power, which may reduce the need for going-concern type modifications. Hence large companies may be less likely to require audit modification. Larger companies may also be able to exert a greater switch

threat over their auditors than small companies, decreasing auditor independence. Large values of assets may, however, be overstated in the accounts and therefore may in fact increase the likelihood of an audit modification on grounds of disagreement. In addition, litigation risk faced by auditors may be more important for larger companies. Hence the impact of company size on audit reporting is uncertain.

Company size, measured by the book value of total assets ('totass'), has been included to test the hypothesis that large companies are more (less) likely to receive modified audit opinions than small companies.

The dummy variable 'subsidi', indicating whether the company is a subsidiary or not, has been included to test the hypothesis that subsidiary companies are less likely to receive modified audit reports than other companies. Subsidiaries may be less likely to receive modified audit reports because they may receive financial support from the parent or other group companies, reducing the need for going-concern type modifications, and because group companies often share an accounting function which has greater resources and is therefore of higher quality than the accounting function of a similar individual company, reducing the need for qualifications on the grounds of inaccuracies, poor record-keeping and incorrect application of accounting standards.

### 3.1.2. Risk Variables

Several measures of liquidity and financial risk are included - the quick ratio ('quick') and gearing<sup>4</sup> ('gear') - to test the hypotheses that companies with poor liquidity are more likely to receive modified audit opinions related to going concern than other companies, and that companies with high financial gearing are more (less) likely to receive modified audit opinions than other companies. Bankruptcy studies such as those by Lennox (1999) and Hopwood, McKeown and Mutchler (1989) have shown that high gearing is significant in predicting bankruptcy. In particular, Hopwood et al. (1989) show that high ratios of long-term debt to total assets two and three years prior to bankruptcy are significant predictors of bankruptcy in listed US companies, but not in the year immediately prior to bankruptcy.

The likelihood of modifications relating to going concern issues may increase because poor liquidity and high financial risk increase the likelihood of business failure. Lennox (1999) shows that poor liquidity and high gearing increase the likelihood of listed companies receiving going-concern type audit modifications. However, although Dopuch et al. found that gearing is significant in predicting modified audit reports on listed US companies, Keasey et al. did not find gearing

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<sup>4</sup>Leverage

ratios to be significant for small UK companies. It is possible that high gearing or poor liquidity may increase switch threats to auditors, as companies in poor financial positions may place more importance on receiving clean audit reports to attract or retain finance, hence reducing the likelihood of audit modification, although auditors may be less susceptible to client pressure if there is a corresponding litigation risk. Monitoring by lenders, such as banks, may also reduce the likelihood for errors and inaccuracies in the financial statements and hence reduce the likelihood of disagreement-type modifications.

Contingent liabilities ('cont') are included to test the hypothesis that companies with high contingent liabilities may be more (less) likely to receive modified audit opinions. They may be more likely to receive modified audit opinions related to going concern issues if the presence of high levels of contingent liabilities increases fundamental uncertainties in the financial statements, but they may be less likely to receive other types of audit modification if the presence of reported contingent liabilities reduces the need for disagreement type qualifications.

A dummy variable indicating a loss in either the current or prior year ('loss') is included as a profitability measure to test the hypothesis that companies with poor (negative) profitability are more likely to receive modified audit opinions than companies with good profitability, and has been found to be significant in



previous studies. This may be because losses reduce liquidity and may therefore increase the going-concern risk.

### **3.1.3. Auditor Variables**

Two variables related to the auditor have been included, namely the auditor's fees ('fee') and the auditor size ('big').

In the UK, all fees paid to auditors (both for audit and for non-audit services) must be disclosed. Instead of including audit fees and fees paid to auditors for other services separately, their sum (total auditor's fees) was included. This allows for the prospect that fees paid to auditors may be misclassified.

The total auditor's fees ('fee') have been included to test the hypothesis that companies paying large audit fees to their auditors may be more (less) likely to receive modified audit opinions than companies paying smaller audit fees. The likelihood of modification may be increased if high audit fees are an indication of a high audit risk assessment by the auditors. The likelihood may however be decreased if high audit fees are an indication of reduced auditor independence.

The dummy variable indicating whether the company is audited by a 'big-six' audit firm<sup>5</sup> ('big') is included to test the hypothesis that companies which are au-

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<sup>5</sup>The 'Big-Six' consist of Arthur Andersen, Coopers & Lybrand, Deloitte & Touche, Ernst &

ditioned by big-six audit firms are more (less) likely to receive modified audit opinions than other companies. Big-six audit firms may be more likely to modify if big-six audit firms are higher quality (DeAngelo, 1981, Dye, 1993). However, it is often company management that chooses the auditors (rather than the shareholders, who in practice often merely ‘rubber stamp’ management’s decision) so care must be taken when interpreting the results in this respect; companies choosing big-six audit firms may share other characteristics which actually reduce the likelihood of modification.

#### **3.1.4. The Audit Lag**

The audit lag is the length of time between the accounting year end and the date the audit report is signed. It is proxied in this study by the number of days between the accounting year end and the date the accounts are filed at Companies House (‘lag’), as the data was not available to determine the date that the audit report was signed. This is reasonable as the audit report is often the limiting factor in respect of filing.

The audit lag variable has been found to be significant in earlier studies - the longer the lag, the more likely a company is to receive a modified audit opinion.

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Young, KPMG Audit and Price Waterhouse. They have since been reduced to a ‘Big-Five’ by the merger of Price Waterhouse and Coopers & Lybrand to form PriceWaterhouseCoopers.

This has several explanations. Firstly, the length of the lag may relate to lengthy negotiation between the auditor and the client over the form of the final accounts and the associated audit report - if the auditors wish to modify their report such negotiations are likely to take longer. Secondly, a long lag may result if the auditors have identified problems and need to perform additional audit work. Thirdly, a long lag may simply reflect that the company has high inherent and/or control risk and therefore requires more audit work in the first place. Finally, and especially with regard to going-concern, auditors may seek to delay expressing an audit opinion or finalising their report, in the event that a problem has been identified, in the hope that it will be resolved prior to publishing the accounts and a modification can thereby be avoided.

As with auditor choice, care must therefore be taken when interpreting the coefficient on the audit lag variable - a long lag may result from rather than be indicative of a modification requirement.

### **3.1.5. The Lagged Audit Report**

There is evidence that suggests that audit reports are persistent (see e.g. Monroe and Teh, 1993; Krishnan et al., 1996); in other words, companies receiving a modified audit report one year are more likely to receive a modified audit report

in the following year than companies receiving a clean report, and vice versa.

Modified audit reports may persist for several reasons. Firstly, there may simply be continuing problems (poor record-keeping, poor internal controls, poor management integrity, and so on) in the companies concerned which may be unobserved, although Lennox (1999) showed that lagged audit reports do not capture unobserved information relating to financial distress. Alternatively, persistence of modifications may result from fear of litigation on behalf of auditors, who may continue to modify their reports on companies in subsequent years even if the problem(s) resulting in the original modification have been resolved. Persistent modification may also arise where there are litigation threats or threats to reputation if there is an absence of a credible switch threat from the client companies (if an auditor has modified the audit report once, and the client has not switched to a new auditor, then the switch threat may no longer influence the audit reporting decision).

In many cases, persistent clean reports may simply indicate that the companies are indeed reporting correctly. However, although auditors are often sued for failing to modify their opinions when companies do not report true and fair financial statements, clean reports may persist even if a problem with the accounts exists. This may be due to what is known as the 'growing problem' effect; a

problem may be identified by an auditor at an early stage, when its (potential) impact on the financial statements is deemed insufficient to warrant a modified report. This problem may then grow, but in subsequent years the auditors may continue to ignore it, either out of embarrassment because it has become apparent that it should have been reported on in an earlier year, or simply because it was allowed to pass without comment on every previous occasion. Alternatively, the persistence of clean reports may be due to switch threats, causing auditors not to modify their opinions for fear of losing the client's fee income, or some other loss of auditor independence. Finally, persistence may simply arise from a failure by the auditor to identify problems requiring modification (negligence in the conduct of the audit itself).

Clean audit reports may therefore persist as auditors are reluctant to issue first-time modifications; however once a modification has been issued further modifications become more likely even if the original problem may have been resolved.

The appropriate lagged audit report variable ( $MOD_{t-1}$  for the logit models and  $Q_{t-1}$  for the multinomial logit models) has been included in each model to test the significance of persistence in audit reporting.

The inclusion of the lagged audit report may introduce endogeneity problems into the model, as the lagged audit report will depend on lagged financial variables

in a similar fashion to the dependence of the current audit report on the current financial variables. This work therefore requires the assumption that the initial condition (i.e. the lagged audit report) is fixed.

### **3.1.6. Company Type Variables**

The dummy variable ‘list’ is included in models two and four, taking the value one if a company is quoted on either the main London Stock Exchange or on AIM, and zero otherwise. This dummy variable allows potential listed company type effects, as discussed in section 2.2, to be identified. Note however that there may be more than one company type-specific effect, and that these may cancel each other resulting in no net significant effect. Such a result cannot therefore be interpreted as indicating no company type-specific effects.

## 4. The Data

The data for the study is taken from OneSource<sup>6</sup>, UK Companies Volume 1, July 1998. As well as company type (e.g. public limited by share capital, private limited by share capital), OneSource contains historical data taken from published financial statements, accounting ratios, data on company listings, company ownership (i.e. whether a company is a subsidiary company), the name of the company's current auditor (and in some cases the date of appointment), the industry in which the company operates, and the audit reports on the financial statements. OneSource classifies audit reports into clean reports and various modification types as follows: fundamental uncertainties relating to going concern, 'mild' 'except for' disagreements, 'except for' limitations on scope, 'severe' adverse or disclaimer opinions, and reports featuring clean opinions but with additional explanatory paragraphs not related to going concern.

The dependent variable in the logit estimations (models one and two),  $MOD_t$ , takes the value one if the current (most recent) audit report is modified in any way,

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<sup>6</sup>OneSource is a commercially available database of financial information relating to UK companies. The information is held on two CD-ROMs, Volume 1 and Volume 2. Volume 1 holds data on 110,001 UK companies, including all public limited companies and all companies with more than 50 employees, the remainder of the sample comprising the largest UK companies not already included, selected on the basis of turnover, total assets, net worth, or shareholder funds, whichever figure is the highest. Volume 2 holds data on the next 250,000 UK companies, selected on the same basis, with the lowest cut-off value at approximately £38,000.

and zero otherwise. The dependent variable in the multinomial logit estimations (models three and four),  $Q_t$ , takes the value zero if the current audit report is clean, two if the audit report discloses a fundamental uncertainty related to going-concern (a ‘GC’ modification), and one if the audit report contains any other modification (a ‘non-GC’ modification).

To reduce data collection costs, and because modified audit reports have a low occurrence (studies typically quote rates of around 2 or 3%), a choice-based sample was used. OneSource UK Companies Volume One contains data on 77,894 companies with at least two years of accounting data and reported audit reports for the most recent year. Of these, 5,229 companies have modified audit reports in the most recent year and non-missing audit reports in the next most recent year, and are all included in the sample. From the original total of 5,229 modified companies, 2,123 are missing gearing and/or quick ratios, and a further 887 are missing audit fees, resulting in the final total of 2,219 modified companies. Of the 72,665 companies receiving clean audit reports, 49,727 have non-missing audit fees, prior year audit reports and quick and gearing ratios. Of these, 7,267 (one tenth) companies were sampled at random to reduce data collection costs. These sample weights are taken into account in the subsequent estimations, which are conducted



<b>Model</b>	One, Three	Two, Four	
Companies	Private	Public	Total
Observations	8,442	1,044	9,486
GC Modifications	397	43	440
Other Modifications	1,646	133	1,779
Total Modified	2,043	176	2,219

Table 4.1: Final Estimation Sample

using the survey estimation commands in the software package STATA<sup>7</sup>.

The final estimation sample consists of 9,486 companies of which 7,267 received a clean report on the most recent financial statements, 429 received going-concern related modifications and 1,594 received other modifications. Values for contingent liabilities are missing from a further 308 modified and 937 clean companies. As contingent liabilities are disclosed only in the notes of the accounts when necessary, missing values for contingent liabilities are assumed to be zero.

The composition of the samples used to estimate each model are detailed in table 4.1.

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<sup>7</sup>The logistic and multinomial logistic regressions are estimated using pseudo-maximum-likelihood methods; the point estimates are obtained from a weighted maximum-likelihood estimator. The final sample of 7,267 clean companies was selected from a population of 49,727 companies with non-missing audit fees, prior-year audit opinions, quick and gearing ratios, giving a weight of 6.84 to each clean company observation. Modified company observations had a weight of 1. The models in this paper were also re-estimated using weights of 10 for clean companies and 1 for modified companies; the results were qualitatively identical and are not reported here.

<b>Variable</b>	<b>Obs.</b>	<b>Mean</b>	<b>Min</b>	<b>Median</b>	<b>Max</b>	<b>Std. Dev.</b>
totass	9,486	0.142	2	3,000	286m	3,599,072
subsid	9,486	0.472	0	0.000	1	0.499
quick	9,486	3.193	0	0.910	8,273	99.969
gear	9,486	9.111	0	0.140	18,089	265.351
loss	9,486	0.181	0	0.000	1	0.385
cont	9,486	5,122	0	0.000	15.5m	184,252
big	9,486	0.387	0	0.000	1	0.487
fee	9,486	45.778	0	8.000	23,400	383.504
lag	9,486	239.683	2	229.000	982	121.245
MOD <sub>t-1</sub>	9,486	0.175	0	0.000	1	0.380
Q <sub>t-1</sub>	9,486	0.207	0	0.000	2	0.479
list	9,486	0.040	0	0.000	1	0.197

Table 4.2: Descriptive Statistics for the Final Sample of Companies

#### 4.1. Descriptive Statistics

Descriptive statistics for the untransformed explanatory variables, for the whole sample, are detailed in table 4.2.

#### 4.2. Rank Transformations

Accounting ratios and financial variables commonly suffer from problems of skewness and outliers. These problems are evident in the descriptive statistics of table 4.2. Studies often control for skewness by performing logarithmic and square root transformations, and trim or truncate sample distributions to remove outliers. However, Kane and Meade (1998) showed that rank transformations perform better in resolving both these problems.

Variable	Whole Sample		Private Companies		Public Companies	
	Mean	Median	Mean	Median	Mean	Median
rtotass	0.539	0.555	0.520	0.531	0.693	0.804
subsid	0.472	0.000	0.498	0.000	0.264	0.000
rquick	0.545	0.561	0.542	0.553	0.570	0.576
rgear	0.511	0.511	0.505	0.503	0.556	0.587
loss	0.181	0.000	0.180	0.000	0.188	0.000
rcont	0.514	0.406	0.513	0.406	0.520	0.406
big	0.387	0.000	0.371	0.000	0.523	1.000
rfee	0.511	0.520	0.487	0.472	0.704	0.797
lag	239.683	229.000	245.780	245.000	190.376	181.000
MOD <sub>t-1</sub>	0.175	0.000	0.183	0.000	0.105	0.000
Q <sub>t-1</sub>	0.207	0.000	0.216	0.000	0.134	0.000
list	0.040	0.000	n/a	n/a	0.368	0.000

Table 4.3: Descriptive Statistics for Public and Private Companies

The procedure involves replacing each observation with its rank within the sample (tied observations are allotted the average rank), and then dividing each observation by  $n+1$ , where  $n$  is the number of observations. Thus, the ranked observations are uniformly distributed between zero and one.

All ratios included in the explanatory variables ('quick' and 'gear') and the size, auditor's fees and contingent liabilities variables ('totass', 'fee' and 'cont') are rank transformed in this manner. In the following discussions, variables which are rank transformed are indicated by the prefix 'r'.

Descriptive statistics for the transformed variables are detailed in table 4.3. The correlation matrix is reported in table 4.4.

<b>Variable</b>	rtotass	subsid	rquick	rgear	loss	rcont	big
rtotass	1.000						
subsid	0.261	1.000					
rquick	-0.034	0.116	1.000				
rgear	0.205	-0.053	-0.241	1.000			
loss	-0.054	0.066	0.013	-0.022	1.000		
rcont	0.199	0.179	-0.030	0.039	0.001	1.000	
big	0.452	0.391	0.124	0.033	0.056	0.101	1.000
rfee	0.635	0.082	0.026	0.146	0.022	0.163	0.319
lag	-0.058	-0.007	-0.048	0.012	0.055	0.004	-0.037
$Q_{t-1}$	-0.056	-0.087	-0.126	0.064	0.084	-0.007	-0.098
list	0.245	-0.163	0.056	0.028	0.018	0.042	0.164

<b>Variable</b>	rfee	lag	$Q_{t-1}$	list
rtotass				
subsid				
rquick				
rgear				
loss				
rcont				
big				
rfee	1.000			
lag	-0.037	1.000		
$Q_{t-1}$	-0.031	0.084	1.000	
list	0.263	-0.125	-0.052	1.000

Table 4.4: Correlations of Explanatory Variables

$Q_t$	$Q_{t-1}$			Total
	clean	non-GC modification	GC modification	
clean	7,158	68	41	7,267
non-GC modification	493	1,234	52	1,779
GC modification	178	46	216	440
Total	7,829	1,348	309	9,486

Table 4.5: Persistence in Audit Reporting

Of particular interest may be the distribution of large ('big-six') audit firms between different company types. Both the mean and median of the variable 'big' differ significantly between private and public companies (as measured by a two-sample t test and two-sample Mann-Whitney test respectively). All other variables, except for the loss dummy ('loss') and contingent liabilities ('rcont'), also have significantly different distributions between private and public companies.

It may also be of interest to examine the pattern of persistence in audit reporting in the data (table 4.5). Although it is clear that there is strong persistence for particular types of audit modification, many companies that receive modified audit reports related to going concern also subsequently receive non-going-concern modifications, and vice versa.

## 5. Estimation Results

The results of the estimations of the logit models of audit reporting (models one and two) are reported in table 5.1. Estimated coefficients and robust standard errors<sup>8</sup> are reported.

The results of the estimations of the multinomial logit models of audit reporting (models three and four) are reported in tables 5.2 and 5.3.

### 5.1. Logistic Models

The results of the estimations of the logistic models, models one and two, are reported in table 5.1. Standard errors are reported in parentheses.

There are several variables which are significant in explaining audit modification in both company types, namely the audit lag ('lag') and the lagged audit report ('MOD<sub>t-1</sub>'). As expected, the lagged audit report ('MOD<sub>t-1</sub>') is highly significant and has a positive coefficient in both models, confirming the importance of persistence in audit reporting in this data. The audit lag is also highly significant, and also has a positive coefficient in both models, as predicted.

There are several variables which are significant in explaining audit modification in model one (private companies) alone. These are total assets ('rtotass'),

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<sup>8</sup>Robust to invalidation of the assumption of homoskedasticity.

Variable	Private Companies		Public Companies	
rtotass	0.6614121 (0.2376189)	**	-0.5420134 (0.7451074)	
subsid	-0.3229642 (0.1191176)	**	0.2432475 (0.3608559)	
rquick	-0.4862201 (0.1957454)	*	-0.4499314 (0.499952)	
rgear	-0.253905 (0.1931188)		1.363234 (0.5526935)	*
loss	0.2432513 (0.1521304)		0.7040537 (0.3814208)	
rcont	0.2798307 (0.2554819)		-0.888428 (0.7890431)	
big	-0.4037685 (0.1217566)	**	-0.0246754 (0.4094097)	
rfee	-0.156828 (0.2174757)		-0.1457321 (0.5397754)	
lag	0.0028434 (0.0004317)	**	0.0029731 (0.0007751)	**
MOD <sub>t-1</sub>	4.997419 (0.1165941)	**	4.754488 (0.3848022)	**
list	n/a		-0.4589237 (0.4959461)	
constant	-4.784657 (0.2618374)	**	-4.693718 (0.5895358)	**
	Obs = 8,442		Obs = 1,044	
	F(10,8432) = 191.21	**	F(11,1033) = 17.57	**

Table 5.1: Estimation results for the logit models of audit modification (models one and two). Robust standard errors are reported in parentheses. Variable definitions are given in table 2.

\* - statistically significant at the 5% level

\*\* - statistically significant at the 1% level

the subsidiary dummy ('subsid'), the quick ratio ('rquick') and the auditor size ('big'). Total assets has a positive coefficient, suggesting that companies reporting high asset values are more likely to receive audit modifications, perhaps due to overstatement of asset values, or that litigation risk may be greater for larger companies. Subsidiary companies are less likely to receive modifications than other company types, as expected. Companies with high liquidity, as measured by the quick ratio, are also less likely to receive modifications, as expected. The auditor size dummy is also significant and has a negative coefficient. However, this cannot be interpreted as suggesting that large audit firms are of lower quality than other audit firms, as the companies choosing large auditors may simply be less likely to require audit modification.

Financial gearing ('gear') is significant in explaining audit modification in model two (public companies) alone. It has a positive coefficient, suggesting that increased financial risk may increase the likelihood of public companies receiving modified audit opinions.

Whether the company has suffered a loss in the current or previous year ('loss'), contingent liabilities ('rcont'), audit fees ('rfee')<sup>9</sup>, and listing ('list') are not sig-

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<sup>9</sup>All models reported in this paper were additionally re-estimated with an alternative specification of the audit fee variable, not reported here. The total auditor's fee variable was separated into two separate audit fee (scaled by total assets) and non-audit fee (not scaled) variables, which



nificant in either model.

The intercept (constant) terms of each estimation are not significantly different from each other, implying that public companies as a whole are no more or less likely to receive modified audit reports than private companies.

## 5.2. Multinomial Models

### 5.2.1. Private Companies

The results of the estimation of model three (table 5.2), a multinomial logit model estimated over private companies, reveal interesting differences in the determinants of different types of modified audit reports on these companies. The base choice in this model is that of a clean audit report.

The audit lag ('lag') and the lagged audit report (' $Q_t$ ') are significant for both modification choices (GC and non-GC), and have positive coefficients as expected.

Size ('totass') is also significant for both modification choices, but has a positive coefficient for non-GC modifications and a negative coefficient for GC modifications. This would be consistent with both large companies being less likely to fail, for example because they have greater financial resources, and high reported

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were both rank transformed. In no model was either audit fee variable significant, although ranked total assets became insignificant in model one (p-value 0.246) and for the going-concern modification choice in models three and four (p-values 0.621 and 0.703 respectively).

Private Companies			
Variable	Non-GC Modification		GC Modification
rtotass	1.332251 ** (0.2349845)		-0.938889 * (0.4092296)
subsid	-0.5372803 ** (0.1185655)		-0.0974641 (0.1946514)
rquick	-0.1385632 (0.175134)		-2.20527 ** (0.3195532)
rgear	-0.4115032 * (0.1875826)		0.5480491 (0.2817999)
loss	-0.0087051 (0.156419)		0.9786009 ** (0.193932)
rcont	-0.1365913 (0.2256651)		1.369044 ** (0.3593004)
big	-0.7017544 ** (0.1250917)		0.2133699 (0.1964359)
rfee	-0.1464844 (0.2045284)		0.4401132 (0.3595327)
lag	0.0026673 ** (0.000347)		0.0038564 ** (0.0005403)
$Q_{t-1}$	3.561992 ** (0.211095)		3.836576 ** (0.0005403)
constant	-4.583256 ** (0.2190674)		-6.942974 ** (0.3830866)
Obs	= 8,442		
F(20,8422)	= 44.47	**	

Table 5.2: Estimation results for the multinomial logit model of audit reporting, relative to the base choice of clean report, on private companies (model three). Robust standard errors are reported in parentheses.

\* - statistically significant at the 5% level

\*\* - statistically significant at the 1% level

values of total assets indicating overstatements resulting in disagreement-type modifications.

For non-GC modifications, relative to clean reports, subsidiary status ('subsid'), gearing ('rgear'), and the large audit firm dummy ('big') are also significant. The coefficient on the subsidiary dummy is negative, indicating that subsidiary companies are less likely to receive non-GC-type modifications, consistent with higher quality accounting functions in group companies. Gearing has a negative coefficient, although it has a positive (insignificant) coefficient for the GC modification choice. This may suggest that although high gearing increases going-concern risk, it reduces the likelihood of occurrence of other matters requiring modification, possibly due to selection of high quality companies by lenders or to monitoring by lenders. The coefficient on the auditor size dummy is negative, indicating that companies which are audited by Big-Six auditors are less likely to receive non-GC modifications. This may suggest either that Big-Six auditors are less conservative or of lower quality (contrary to theory), or that companies choosing Big-Six auditors are less likely to require non-GC audit modifications. The auditor choice is not significant in explaining GC modifications

For GC modifications, in contrast, significant variables other than the audit lag and the lagged audit opinion, include liquidity ('rquick'), contingent liabilities

(‘rcont’) and the loss dummy (‘loss’). None of the other variables found to be significant in the non-GC modification decision are significant in explaining this decision. The loss dummy has a positive coefficient and liquidity has a negative coefficient, indicating, as expected, that increased financial risk increases the likelihood of a GC-modification. Contingent liabilities also have a positive coefficient for this choice, as expected.

### **5.2.2. Public Companies**

The results of the estimation of model four on public companies alone, reported in table 5.3, show some noticeable differences to the results of model three, although, as before, the audit lag (‘lag’) and the lagged audit report (‘ $Q_{t-1}$ ’) are significant and positive for both choices.

For the choice of non-GC modifications, total assets (‘rtotass’) and the subsidiary dummy are no longer significant. The sign on total assets has also changed direction, indicating that for public companies, larger companies are less likely to receive non-GC audit modifications. This is consistent with larger public companies possessing better quality accounting functions than smaller public companies. Whether the company has a big-six auditor or not (‘big’) is also no longer significant, although the sign remains negative. The gearing ratio (‘rgear’) remains

<b>Public Companies</b>		
<b>Variable</b>	<b>Non-GC Modification</b>	<b>GC Modification</b>
rtotass	-0.2661433 (0.6501694)	-2.626723 * (1.119717)
subsid	-0.0078242 (0.3217766)	0.5771852 (0.5139024)
rquick	0.3398597 (0.6102656)	-3.512821 ** (1.016074)
rgear	1.172863 * (0.517735)	0.8187192 (0.8196033)
loss	0.318793 (0.3978931)	1.285683 * (0.502226)
rcont	-0.5929162 (0.669502)	0.515607 (1.000848)
big	-0.0962745 (0.3973804)	0.4793307 (0.5901067)
rfee	-0.0270532 (0.4767705)	1.555353 (1.080155)
lag	0.0025988 ** (0.0007538)	0.003953 * (0.0015669)
Q <sub>t-1</sub>	3.35049 ** (0.5113961)	3.450704 ** (0.6147442)
list	-1.430565 * (0.6961656)	-0.4445738 (0.8295568)
constant	-4.970066 ** (0.5806661)	-5.851572 ** (0.9694936)
Obs	= 1,044	
F(22,1022)	= 7.12	**

Table 5.3: Estimation results for the multinomial logit model of audit reporting, relative to the base choice of clean report, on all public companies (model four). Robust standard errors are reported in parentheses.

\* - statistically significant at the 5% level

\*\* - statistically significant at the 1% level

significant but the sign of the coefficient is now positive, whereas in private companies high gearing reduced the likelihood of non-GC modifications.

In addition, listed companies ('list') are significantly less likely to receive non-GC audit modifications than other public companies<sup>10</sup>, possibly because they have higher quality accounting functions due to their increased size or market regulations, or because of increased pressures on auditor independence.

For the choice of GC modifications, total assets is now significant whereas for private companies it was insignificant. The coefficient is negative, suggesting that larger companies may have less risk. Unlike the case of private companies, contingent liabilities are not significant in explaining GC modifications in public companies. although the sign remains positive. As with private companies, losses or poor liquidity significantly increase the likelihood of companies receiving GC modifications. Listing is not significant in explaining these modifications.

## **6. Conclusions and Discussion of Results**

The main results of the paper are summarised in table 6.1, which shows the directions of influence of the significant variables in each model. It can be seen that

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<sup>10</sup>In results, not reported here, of a multinomial logistic regression of this model on both company types, listing was also shown to significantly decrease the likelihood of non-GC-type modifications compared to either public, non-listed or private companies.

the determinants of modified audit opinions differ according to company type and the type of modification (GC or non-GC). In particular, listed companies are significantly less likely to receive non-GC audit modifications than other companies, but otherwise company type does not affect the likelihood of companies receiving modified audit reports. Private companies with large auditors are significantly less likely to receive non-GC modifications compared to other private companies but auditor size does not significantly affect modifications on public companies. Size and subsidiary status significantly affect non-GC modifications on private companies but not on public companies, whereas size significantly affects GC modifications on both public companies and private companies. Contingent liabilities significantly affect GC modifications on private companies but not on public companies. Audit fees are not significant in explaining any audit modifications on any companies. Finally, high gearing significantly increases the likelihood of public companies receiving non-GC modifications whereas it significantly decreases the likelihood of private companies receiving non-GC modifications.

Private limited companies are often owner-managed and so the benefits of audits on private companies for stewardship purposes are questionable. Differences in audit reporting between private and public companies may reflect different requirements for stewardship information from users of accounts, as different de-

<b>Modifications:</b>	<b>All</b>		<b>GC</b>		<b>Other</b>	
<b>Companies:</b>	<b>Private</b>	<b>Public</b>	<b>Private</b>	<b>Public</b>	<b>Private</b>	<b>Public</b>
<b>Influence</b>						
rtotass	+	-	-	-	+	
subsid	-				-	
rquick	-		-	-		
rgear		+			-	+
loss			+	+		
rcont			+			
big	-				-	
rfee						
lag	+	+	+	+	+	+
MOD <sub>t-1</sub> /Q <sub>t-1</sub>	+	+	+	+	+	+
list	n/a		n/a		n/a	-
constant	-	-	-	-	-	-

Table 6.1: Significant Determinants of Audit Reports in the UK

degrees of reliance on the audit report by users may be reflected by different degrees and types of risks (client switch threats, litigation threats and potential reputation losses) faced by auditors who report on listed, public non-listed or private companies.

In particular, the financial statements of listed companies may be of higher quality than those of other companies, due to compliance with market regulations, media interest, and greater financial resources. This would be consistent with market listing reducing the likelihood of non-GC-type modifications, as evidenced in this paper. Alternatively, the likelihood of audit modifications may be reduced if listed companies are able to exert greater switch threats over auditors



than other companies (due to greater prestige and/or fees), although auditor fees were insignificant in all modification choices. That listing does not appear to significantly affect GC modifications may indicate that listed companies are no more or less likely to suffer going-concern problems than other companies with similar observable characteristics, or that the associated litigation and reputation threats on auditors failing to report going-concern problems in listed companies outweigh any increased switch threats where these modifications are concerned.

That auditor fees are never significant in explaining audit modifications suggests that high fees may not be associated with compromised auditor independence.

The signs of the (significant) coefficients on gearing in non-GC modifications differ between private and public companies. Private companies with high gearing are less likely to receive non-GC modifications whereas public companies with high gearing are more likely to receive non-GC modifications. High levels of gearing may increase client switch threats due to reliance on clean audit reports by lenders, although this is also likely to increase litigation and reputation threats as well. Switch threats may outweigh litigation/reputation threats in private companies but fail to do so in public companies. It is also interesting that high levels of gearing, commonly viewed as being associated with high financial risk, do not

significantly increase the likelihood of any company receiving GC audit modifications, although the coefficients do have positive signs. This is not inconsistent with the range of results reported in other studies.

Lastly, auditor size significantly decreases the likelihood of non-GC modifications, and of modifications overall, in private companies but not in public companies (although the signs of the coefficients remain the same). This may indicate that large auditors are less conservative when reporting on private companies, or alternatively that large auditors are chosen by private companies which have high quality accounting functions or other characteristics which reduce the need for audit modification, but that public companies may choose large auditors for other reasons.

Further research is required to examine the determinants of auditor choice in public and private companies, and to deal with the endogeneity of the auditor choice. The size of the audit firm (i.e. whether it is a Big 6 audit firm or not) appears to be important in explaining audit reporting on private companies. However, this significance may not reflect different characteristics (quality) of the auditors but merely client company characteristics that either determine, or that are correlated with characteristics that determine, the auditor choice. For example, the lack of significance of auditor size in determining audit report modifi-

cations in public companies may arise because public companies may have reasons for choosing auditors which do not correspond to the reasons private companies may have, and which in the case of public companies happen to have no effect on audit opinions. Controlling for the choice of audit firm by the client company should enable us to determine whether there are any differences in audit reporting by audit firms of different sizes.