

Testing the Going Concern Assumption in Financial Audit Engagement using Duration Models

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Abstract

The role of the financial audit in testing the going-concern assumption is always evolving, being updated in response to events as diverse as financial and health crises and financial scandals. Normally, a company's management is responsible for preparing and reporting financial statements on the assumption that it will continue as a going concern within a foreseeable time horizon without going into liquidation or significantly winding down its operations. Thus, the financial auditor expresses a going concern opinion based on sufficient appropriate audit evidence. The purpose of this study is to estimate the probability of a situation occurring over time in which the entity can no longer continue its activity based on the auditor's observations in the audit report, under the influence of the determining factors on the financial position and performance, as well as those on the earnings management, under the conditions of IFRS application. The study is conducted at the level of Romanian entities listed on the regulated market - Bucharest Stock Exchange (BSE), for the period 2012-2023. The research results indicate a direct and significant influence of the liquidity ratio, as well as of the earning management operations on the probability of occurrence over time of the situation in which the entity can no longer continue its activity based on the auditor's observations on the going concern.

Key words: financial auditing; going concern; duration models; survival analysis; financial indicators; Bucharest Stock Exchange;

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1. Introduction

As a fundamental principle of accounting, *going concern* assumes that, when preparing and reporting financial statements, management expects that the entity will continue in operation for a foreseeable period without the intention to liquidate or curtail its operations, with a direct impact on asset measurement, liability recognition and financial reporting (Istrate, 2021). If the going concern assumption is not met, then the entity's management must disclose a number of adjustments in the financial statements, precisely to allow predictability of the business and of how the entity's resources are managed (Bunce & Clayton, 2011).

In respect of going concern, the financial auditor is responsible for assessing the entity's ability to continue as a going concern and for considering whether there are any material going concern uncertainties to be disclosed in the audit report (Geiger & Raghunandan, 2002). The reputational as well as litigation risks that financial auditors take in their assignments (Kausar *et al.*, 2017) lead them to be more careful to identify as accurately as possible the problems that client entities might have. There is evidence to support the fact that auditors often refer to audited companies' going concern issues precisely as a preventive action to limit audit risk (Kaplan & Williams, 2013). This requires the financial auditor to obtain sufficient and relevant audit evidence, which may include analysing financial projections, verifying financing plans, assessing contractual commitments and examining risk management policies, using signal indicators of significant financial losses, insufficient liquidity, difficulties in accessing finance or meeting payment obligations and, last but not least, possible legal issues (Nogler, 2008; Carson *et al.*, 2013).

It is often argued that the adoption of *International Financial Reporting Standards* (IFRS) leads to increased transparency in financial reporting, including the quality of going concern disclosures, providing users with more relevant information (Ali *et al.*, 2019). This information may refer to the profitability of the entity, leverage, and utilization of earnings management operations. (Alqam *et al.*, 2022).

The purpose of this study is to estimate the probability that the audited entity will not be able to continue as a going concern with the application of IFRS over time, based on the Going Concern Opinion (GCO) expressed in the audit report, using survival analysis and duration models, the

influence of the determinants of financial position and performance, and the influence of the determinants of earnings management operations. Specifically, the study investigates the length of time since first-time application of IFRS that the audited entity is unable to continue as a going concern, given the matters that the auditor reports in the audit report as going concern issues. The probability of going concern issues arising over time may be affected by operational factors (profitability and performance indicators), accounting distortions (discretionary accruals), as well as the financial structure of the company (debt, equity). The study is conducted on Romanian entities listed on the Bucharest Stock Exchange, on the regulated market, in the period 2012-2023. The results of the study indicate a direct and significant influence of liquidity ratios as well as earnings management operations on the probability of going concern issues over time, starting from the auditor's observations on going concern in the IFRS period.

The study is structured in five sections, including the introduction and conclusions. Section two provides a review of the literature that follows the issue under analysis, section three proposes the research methodology, emphasizing survival analysis and duration models, and section four presents and discuss the research results.

2. Literature review and research hypothesis development

Stakeholders also judge the quality of companies' reporting in terms of the transparency of disclosure by those responsible for preparing the financial statements, but also by those who guarantee their credibility, namely the financial auditors. Thus, the auditor's detection and reporting of events and evidence that may affect the going concern of the entity can be interpreted as an important issue for users of financial reporting. However, the number of GCOs is not expected to be very large. In this regard, Tagesson & Öhman (2015) find ample evidence in the literature that auditors are reluctant to express such opinions.

Providing a GCO is primarily a matter of professional judgment and auditors use a range of quantitative and qualitative tools to justify their judgment. (Hossain *et al.*, 2020).

2.1. The role of the financial auditor in testing the application of the going-concern principle

Audit quality, closely related to the quality of financial reporting, although difficult to measure, is proxied in the literature using many variables (each with its advantages and disadvantages). DeFond & Zhang (2014) identify, among these proxies, the modified going-concern justified opinion (GCO). They characterize this opinion as follows: it is a current, relatively straightforward, fairly blatant measure, the measurement error is average, it demonstrates auditor independence but does not capture subtle variations in audit quality, it can only be applied to firms in difficult situations (the limited number of such firms reduces the statistical power of models that use it), and it can sometimes indicate an excess of caution on the part of the auditor. Moreover, issuing a modified opinions (with or without reference to going concern issues) is generally used as a measure of auditor independence (Garcia-Blandon & Argiles, 2015) and it is useful to separate modified opinions with reference to going concern problems from other modified opinions, as the impact may be different.

The literature proposes to compare the accuracy of audit reports by measuring two errors, in the case of GCO and/or bankruptcy of the firm for which the opinion was issued. Koh (1991) tells us that the type I error rate is the proportion of bankrupt firms that received unmodified opinion (no GCO), and the type II error rate is the proportion of firms that survived despite receiving modified opinion (GCO). The results reported in various studies are not entirely convergent in terms of using GCO, per se, as a proxy for audit quality. Chu *et al.* (2022) claim that, in general, GCO is not a sign of audit quality, but that it may only fit here when auditors issue more GCOs to clients who deserve this qualification by being in serious financial difficulty (Type I error mitigation) and fewer GCOs to those who do not necessarily fall along these lines - even if they are in financial difficulty, the measures taken by management seem to ensure continuity - (Type II error mitigation).

In turn, Guo *et al.* (2020) find a link between firm financial distress and GCO only when audit quality, as measured by discretionary accruals, is high. A quality audit requires competence and independence of the auditor (DeAngelo, 1981). The results reported by Ruiz-Barbadillo *et al.* (2004) show that the issuance of a GCO depends on the audited firm's financial problems, but also on the auditor's independence rather than on the auditor's competence.

The financial difficulties of listed firms also create an unpleasant situation for them in the perception of financial market stakeholders. Investors and others may make important decisions that penalize firms in such situations. Signs of financial distress come from analysts, perhaps even from the reporting firm, in public communications, including financial statements, or from auditors. However, the entry of a firm in a serious financial situation that would justify questioning its ability to continue as a going concern rarely results in actual bankruptcy. Gutierrez *et al.* (2020) find that only 1.8% of distressed firms go bankrupt the following year. With respect to GCO, Gutierrez *et al.*, (2020) count 50% of firms entering bankruptcy that received GCO in a previous year, while 90% of firms that received GCO do not enter bankruptcy in the following year. Along the same lines, DeFond & Zhang (2014) find many studies in the literature analysing the extent to which GCO is useful in predicting bankruptcy, identifying many more type I errors (90%) than type II errors (50%). On the other hand, stakeholders analyse GCO as a confirmation of firms' difficulties, as the auditor's opinion is a delayed signal, however (Myers *et al.*, 2018), which makes survival analysis necessary based on data accessible earlier than the audit report.

The GCO does not necessarily result in bankruptcy (type II error). However, the auditor must exercise caution and take into account the information he or she acquires regarding the difficulties of the firm he or she is auditing. Ittonen *et al.* (2014), analysing US firms - with their specificities in terms of GCOs - gets to results suggesting that auditors should issue GCOs when there is a one in twelve chance for the client's bankruptcy entry.

It should not be forgotten that auditors base their opinion on public information, i.e. accessible to other users, but that they (the auditors) may have access to private information that is not accessible to the public (Carson *et al.*, 2012). This private information may be decisive in determining the type of opinion expressed by the auditor in assessing going concern (Grout *et al.*, 1994).

Qualified opinions can have effects on user perception. In this sense, however, research results are divergent. For example, Pucheta Martinez *et al.* (2004) found, for the Spanish financial market, that qualified opinions do not influence investors' decisions; even GCOs have no effect on possible changes in market prices. On the contrary, Casterella *et al.* (2020) find evidence that stock market participants increasingly trust audit opinion, while Menon & Williams (2010), find significant negative effects of GCOs on stock prices quoted on US stock exchanges,

especially from institutional investors, but also depending on the content of the GCO. Likewise, Kausar *et al.* (2017) show that US and UK investors react negatively to the signal given by the GCO, which demonstrates that this opinion contains relevant information for the financial market. These results demonstrate how much the institutional context in which audited firms operate matters. In turn, Chen *et al.*, (2020), on a sample of Chinese firms, find that the market reacts negatively in the short-run to modified opinions, regardless of whether they are going concern or not, and the magnitudes of this reaction depend on factors related to the information disseminated by the firm before the opinion is published or the severity of the qualified opinion. Khan *et al.* (2017) even analyse the effects of announcements in which, after the financial statements are released, firms again make users aware that they have received GCOs. Khan *et al.* (2017) find that there is a positive and significant relationship between these announcements and the volume of shares traded, as well as with the volatility of the prices of these shares, implying that there are investors who consider these announcements about GCOs to be relevant. Sometimes, in studies on GCOs, it is assumed that such an opinion is sticky, which makes the analysis more relevant when a GCO is issued for the first time, i.e., it follows an unqualified opinion (Hossain *et al.*, 2020; Geiger *et al.*, 2022).

Issuing a GCO is uncommon for listed firms, especially in mature financial markets. However, for firms entering the financial markets and seeking funds for new business development, Foster & Shastri (2016) find 46.8% GCOs in a sample of 1,025 U.S. firms that qualify for what related accounting rules call development stage enterprises. For companies in financial distress that receive modified audit opinions, Tahinakis & Samarinas (2016) find that the market perceives these opinions as relevant if they are given by Big4 auditors and if the firms in question are small.

Extending the analysis from modified opinions to the paragraph emphasizing certain matters is common in the literature: Moalla (2017), on the case of Tunisia, considers both components of the audit report in researching the impact of going concern observations. At the same time, the introduction of mandatory key audit matters (KAM) reporting has also made it possible to find references to business continuity in this paragraph of the audit report. Mareque *et al.* (2017) analyse audit reports, looking for references to going concern in all their paragraphs. Segal (2018) is even of the opinion that, when expressing a GCO, the auditor should always put going concern as KAM.

2.2. Factors affecting the going concern of the entity

In the literature on the rationale for qualified opinions, Moalla (2017) finds that most studies have been interested in the relationship between audit opinion and going concern and that financial variables (found in a greater or lesser number of financial indicators) are the most used in this analysis. This analysis confirms the separation in the study of modified opinion between modified going concern and other modified opinions (Tsipouridou & Spathis, 2014). Bava & di Trana (2019) summarize and present the indicators most commonly used in the literature to indicate going concern issues: liquidity indicators (current assets/current liabilities, interest expense/EBIT, cash and cash equivalents/current liabilities, working capital/total liabilities, operating cash flow/total liabilities); leverage indicators (market value of the firm/book value of debts, equity/book value of debts, long-term debts/assets, total debts/assets); profitability indicators (net profit/assets, equity/equity/assets, EBIT/assets, gross profit/sales revenues, current losses and losses carried forward).

Xu *et al.*, (2018) find a significant and positive relationship between Real Earnings Management (REM) and the probability of financially distressed firms to receive a GCO, suggesting that abnormal firm activities influence auditor prudence and auditor effectiveness. A long list of determinants of GCOs is provided by Averio (2021): firm size, audit quality, firm financial condition, audit lag, some financial indicators. Dhaliwal *et al.* (2020) also adds the dependence of a distressed firm on one or more major clients as a determinant of the GCO given by the auditor.

Gutierrez *et al.*, (2020) analysed the extent to which GCO has additional predictive value over bankruptcy risk determination scores based on financial indicators, market variables and credit ratings. The results reported by Gutierrez *et al.* (2020) show that the number of predicted bankruptcies is 4.4% higher when GCO is taken into account, without increasing the number of type II errors. In the case of Belgium, Vanstraelen (2002) finds that GCO is significantly correlated with factors related to the possible consequences of expression such an opinion. On the other hand, Vanstraelen (2022) finds that GCO is not significantly influenced by the auditor's period of engagement or the type of auditor. Viana Jr. *et al.* (2022) finds that firms in financial distress apply earnings management techniques in emerging countries. Thus, the auditor's opinion is put, in various econometric models, in

relation to discretionary accruals-DA (Berglund *et al.*, 2018). In fact, in studying the impact of audit opinion, the use of discretionary accruals is quite common as a variable measuring the quality of financial reporting (Tsipouridou & Spathis, 2014). For the case of Greece, Tsipouridou & Spathis (2014) do not identify empirical evidence establishing any correlation between GCO and DA; in this context, GCO is best explained by the financial characteristics of the firms involved: poor performance in the current year, loss in previous years.

To determine whether an auditor should have expressed a qualified opinion (GCO), some articles have used indicators specific to bankruptcy risk (Lennox, 1999); such indicators have also been used to measure the accuracy of audit reports. Casterella *et al.* (2020) assures us that there are numerous studies on the differences between Big4 and non-Big4 auditors, in the sense that it has been shown that it is more likely that Big4 auditors issue a GCO for firms in financial distress; also, the literature suggests that investors have greater confidence in financial statements audited by Big4. On the contrary, Hossain *et al.* (2020) find no difference between Big4 and non-Big4 in the association between reporting tone and GCO. Lennox (1999) applies a model to determine bankruptcy risk and finds that it is easier to predict bankruptcy risk for Big4 audit clients than for small audit clients. Lennox (1999) finds that large (Big4) auditors are more likely to express opinions that contain going concern (GCO) references for financially distressed companies and to express unqualified opinions for non-distressed companies. The same sense of the relationship is found by Ruiz-Barbadillo *et al.* (2024). For a number of emerging countries, Viana Jr *et al.* (2022) find that the auditor's membership in the Big4 mitigates the propensity of distressed firms to manipulate earnings compared to non-Big4 audited firms.

Lennox (1999) uses the indicators proposed by Altman to identify firms in financial distress firms: cash flows, firm size, leverage and profitability. Gutierrez *et al.* (2020) compares the predictive ability of GCO with four models: one based on financial indicators and firm size, the second based on market data, the third based on client information and estimates from external sources, and the fourth based on client information and credit rating. Carson *et al.* (2012) find in the literature a large set of indicators that measure a firm's financial distress: low profits or losses, high leverage, low liquidity, small size.

Gutierrez *et al.* (2020) argue that GCO takes into account a complex set of variables that bankruptcy prediction models cannot account for, variables that are related to

the private information to which the auditor has access, but also the fact that the auditor takes into account qualitative variables that cannot be incorporated in models based on financial or market indicators.

In analysing the determinants and consequences of GCOs, it is important to take into account the geographic, institutional, economic, economic, financial and even political context in which the firms under study operate. For example, Syofyan & Vianti (2021) find, for listed Indonesian firms, that leverage (along with audit report lag, opinion shopping and firm size) does not influence GCO. Similarly, Zuhroh *et al.* (2023), for the same context, find that leverage has insignificant influence on GCO, while prior year modified opinion and firm growth percentage affect GCO significantly and positively. Cipriano *et al.* (2017) conclude that auditors of US firms rarely resort to expressing modified opinions. In fact, it is good to keep in mind that the GCO represents the only modified opinion that auditors of firms supervised by the Securities and Exchange Commission (SEC) in the U.S. can issue (DeFond & Zhang, 2014). This characteristic of the U.S. financial market leads to a strong limitation on the generalizability of the results (Garcia-Blandon & Argiles, 2015). It is for this reason that international comparisons involving Romania would do well to limit themselves to the GCO, leaving aside the other justifications for the modified views.

Also, from the literature reviewed by Foster & Shastri (2016), it appears that GCO is strongly correlated with financial structure (leverage, low working capital) and could be influenced by audit fees or litigation risk. The latter aspect should be analysed in the context of the specific economic and legal environment of each context. In the USA, for example, the litigation risk is high, while in continental Europe this risk becomes much more limited (Vanstraelen, 2002). Hossain *et al.*, (2020) find that firms that receive GCO are smaller in size, have scores indicating a higher probability of bankruptcy, are more volatile and are more likely to have significant internal control weaknesses.

Zdolsek *et al.* (2022), after finding an 8% share of qualified going-concern opinions for the period 2005-2013 – with an evident increasing trend over time – for companies from Slovenia, an emerging country in Central and Eastern Europe, establishes the probability of expressing such an opinion using a set of 20 independent variables, including 15 financial indicators, to which are added audit report lag, auditor's busy season, firm age, total assets and the existence of loss in the current year, without market data.

Moalla (2017) finds that liquidity and the existence of losses in the current and prior year are associated with modified opinions, as is leverage. However, during periods of financial crisis, Moalla (2017) identifies a significant decrease in qualified opinions.

The length of an auditor's tenure or auditor rotation may influence the audit opinion. Garcia-Blandon & Argiles (2015) find that the longer the tenure, the less likely it becomes to express a modified opinion, but justified for reasons other than going concern: on the contrary, the GCO is not influenced by the auditor's tenure, due to the litigation risks to which the auditor would be exposed.

2.3. Research hypothesis development

For the identification of risks to going concern, the auditor's application of specific benchmarks may not be sufficient. Even if a list of the elements signaling uncertainty about the going concern of companies is presented in the standards (ISA 570), a hierarchy of these elements is not established (Bava & di Trana, 2019).

Due to the various crises - financial, health, political, energetic, military - financial auditors have to be more careful/cautious in issuing opinions, especially when they are in the situation of expressing a GCO (Beams & Yan, 2015). Geiger *et al.* (2014) find that after the 2008 crisis, auditors (Big4 or non-Big4) became more inclined to provide GCOs for firms in financial distress. But, after a

period of growth in the number of such opinions, the post-crisis situation returned to pre-crisis levels (Read & Yezegel, 2018)

In the situation where managers sell out of the entity's shares, they might put pressure on the auditors not to express a modified opinion due to going concern issues (Chen *et al.*, 2013). Managers are rather optimistic about the entity's going concern, even in unfavourable situations. Auditors, on the other hand, need to be cautious and not necessarily discount managers' estimates (Feng & Li, 2014; Kim M., 2021). However, there have also been situations in which managers' optimism has carried over to auditors, such that cases have been identified in which firms that did not receive previous GCOs went bankrupt in the subsequent period - even more than half (Mareque *et al.*, 2017).

Although the provision of non-audit services can sometimes affect the independence of auditors, it is assumed that in such cases, auditors are more knowledgeable about the client entities and the opinions expressed will be better informed and, by implication, the expression or not of GCO (Geiger *et al.*, 2022; DeSimone *et al.*, 2015).

Table no. 1 lists the influencing factors of GCO, the causalities generated and the source of the studies. These are of interest to our study in supporting the research hypothesis.

Table no. 1. The influencing factors of GCOs, the source and implications of occurrence or non-occurrence		
Influence factors	Source	Implications
Women – auditors and firms in financial difficulties	(Hardies <i>et al.</i> , 2016)	GCO(+)
Big4 Auditors	(Lennox, 1999; Geiger <i>et al.</i> , 2014; Casterella <i>et al.</i> , 2020; Ruiz-Barbadillo <i>et al.</i> , 2024)	
Financial difficulties	(Barbadillo <i>et al.</i> , 2004; Aguilar <i>et al.</i> , 2018; Guo <i>et al.</i> , 2020)	
Financial structure: High debt	(Averio, 2021; Foster & Shastri, 2016; Bava & di Trana, 2019)	GCO (+)
Low liquidity	(Moalla, 2017; Bava & di Trana, 2019)	GCO (+)
Higher profitability	(Averio, 2021)	GCO (-)
Real Earnings Management (REM)	(Chan <i>et al.</i> , 2021; Xu <i>et al.</i> , 2018)	GCO (+)
Management pressures	(Chen <i>et al.</i> , 2013)	GCO (-)
Failure to respect the going concern presumption in preparing annual financial statements	(Robu <i>et al.</i> , 2012)	GCO (+)
Dependence of a firm in difficulty on one or more major customers	(Dhaliwal <i>et al.</i> , 2020)	GCO (+)
Modified opinion from previous year	(Zuhroh <i>et al.</i> , 2023)	GCO (+)
Weaknesses in internal control	(Hossain <i>et al.</i> , 2020)	GCO (+)

Note: GCO (+) is the formulation of the modified going concern opinion; GCO (-) is a non-formulation of the modified going concern opinion

Source: own processing according to the literature studied

Considering the figures already stated in the literature on the studied issue, the following hypothesis is proposed for testing and validation in this paper:

Research Hypothesis: In the context of IFRS application, leverage, operating and financial performance, as well as earnings management operations have a significant influence on the emergence of going concern risk over time, at the level of Romanian firms listed on the BVB.

3. Research methodology

Based on the research hypothesis, the objective of the study is to estimate the probability of the occurrence over time of the situation in which the entity can no continue the activity, based on the auditor's observations presented in the audit report, under the influence of the determinants of financial position and performance, as well as those of earnings management. In order to test and validate the hypothesis, the variables identified in the literature and used in this study are both quantitative and qualitative and are subjected to statistical processing using survival models (Robu *et al.*, 2012). More specifically, the statistical approach followed to test and validate the research hypothesis is applied on a representative sample of the population under study, using advanced statistical methods of data analysis (Robu *et al.*, 2012; Robu, 2021).

3.1. Studied population and analysed sample

The population studied is represented by firms listed on the Bucharest Stock Exchange (BVB) on the Regulated Market, which are also subject to the Law no. 162/2017, and subject to statutory audit. Banking and non-banking financial institutions as well as insurance-reinsurance companies were eliminated from the total number of firms listed on the BVB between 2012 and 2023, so that the sample distributed by year comprises a total of 875 observations, as can be seen in **Table no. 2**. The sample is not balanced, with some firms included in the analysis for the full 12 years, others only for a shorter period. The period analysed is 2012-2023, the starting year (2012) being justified by the fact that it is the first year of mandatory application of IFRS in individual financial statements.

In the next sub-section, we describe the variables identified in the literature and used in the study, as well as the models analysed.

Table no. 2. Number of observations analysed – Sample description

Year	Number of observations
2023	71
2022	71
2021	69
2020	69
2019	70
2018	72
2017	74
2016	75
2015	75
2014	75
2013	77
2012	77
Total	875

Source: own processing

3.2. Description of variables, data source and econometric model analysed

For the firms included in the sample, data were collected from annual financial statements, including the financial audit reports available. The analyse of these data is made using SPSS 25.0 statistical software. The variables are described in **Table no. 3**, categories and explanations are detailed.

From **Table no. 3**, it can be seen that some variables are categorical and others are numerical scaled variables, either being financial indicators or accounting distortions (discretionary accruals). **Tables no. 4** and **no. 5** summarize the situation of nominal variables by year.

Table no. 4 shows that out of the 875 observations, 282 audit reports are issued by Big4 auditors and 593 audit report by non-Big4 auditors. However, 178 audit reports are signed by Non-Big4 internationally affiliated financial auditors. It can also be seen that of the total opinions expressed, 685 are unqualified opinions and 190 are modified opinions (qualified opinions, adverse opinions or disclaimer of opinion).

References to going-concern matters, either in modified opinions, in the emphasis of matter paragraph or in the key audit matter paragraph, are found in 207 cases, as shown in the data in **Table no. 5**.

Table no. 3. Description of the variables used in the proposed econometric models

Variable	Categories	Explanations/Description
Auditor Type	B4 = 1	Big 4
	NB4I = 2	Non Big 4 International affiliate
	NB4L = 3	Non Big 4 Local
Audit Opinion	OP.M = 0	Modified Opinion (Qualified Opinion, Adverse Opinion, Disclaimer of Opinion)
	OP.U = 1	Unqualified Opinion
References to going concern in modified opinions (GCO)	Yes = 1	Occurrence
	Not = 0	Non-occurrence
References to going concern in emphasis of matter paragraph (GC-EMP)	Yes = 1	Occurrence
	Not = 0	Non-occurrence
References to going concern in KAM (GC-KAM)	Yes = 1	Occurrence
	Not = 0	Non-occurrence
ROA	-	Return on Assets (Operating Income/Total Assets · 100)
ROE	-	Return on Equity (Net Income/Equity · 100)
FL	-	Financial Leverage (Total Debt/Equity)
ILR	-	Immediate Liquidity Ratio (Cash assets/Current liabilities)
Abs(DAC) (Absolute value of the discretionary accruals)	-	The working methodology proposed in Grosu M. <i>et al.</i> (2022) was used to calculate Abs(DAC), scaled by the operating income

Source: own projection

Table no. 4. Auditor category and type of opinion

Year	Auditor category			Type of opinion	
	B4	NB4I	NB4L	OP.M	OP.U
0	1	2	3	4	5
2023	25	16	30	6	65
2022	22	20	29	8	63
2021	21	20	28	12	57
2020	19	19	31	14	55
2019	19	18	33	17	53
2018	21	16	35	13	59
2017	24	12	38	17	57
2016	24	14	37	15	60
2015	27	9	39	19	56
2014	26	12	37	20	55
2013	27	11	39	22	55
2012	27	11	39	27	50
Total	282	178	415	190	685

Source: own projection

Table no. 5. Going concern justifications in modified opinions, referring to going concern in the emphasis of matter paragraph and the key audit matter paragraph

Year	References to going concern in modified opinions		References to going concern in emphasis of matter paragraph		References to going concern in KAM	
	GCO (n)	GCO (%)	GC-EMP (n)	GC-EMP (%)	GC-KAM (n)	GC-KAM (%)
(0)	(1)	(2)=(1)/(1) (from table 2) (%)	(3)	(4)=(3)/(1)(fromtable 2) (%)	(5)	(6)=(5)/(1)(fromtable 2) (%)
2023	2	2,82	6	8,45	4	5,63
2022	2	2,82	8	11,27	3	4,23
2021	4	5,80	7	10,14	5	7,25
2020	7	10,14	9	13,04	8	11,59
2019	7	10,00	6	8,57	7	10,00
2018	4	5,56	10	13,89	9	12,50
2017	5	6,76	7	9,46	12	16,22
2016	7	9,33	4	5,33	10	13,33
2015	5	6,67	7	9,33	0	0,00
2014	3	4,00	9	12,00	0	0,00
2013	6	7,79	10	12,99	0	0,00
2012	4	5,19	10	12,99	0	0,00
Total	56	6,40	93	10,63	58	6,63

Source: own projection

Of the total of 207 cases, 56 modified opinions contain references to going concern (6.4% of total observations), 93 audit reports refer to going concern in the emphasis of matter paragraph (10.63% of total observations), and in 58 cases the auditor refers to going concern in the key audit

matters - KAM (6.63% of total observations).

To test and validate the proposed research hypothesis, the following Cox regression model based on survival analysis will be used in the study (Robu *et al.*, 2012):

$$h(t) = [h_0(t)] \cdot e^{\beta_0 + \beta_1 FL + \beta_2 ROE + \beta_3 ROA + \beta_4 RLI + \beta_5 DAC} \quad (1)$$

or in logarithmic form:

$$\ln h(t) = \ln h_0(t) + \beta_0 + \beta_1 FL + \beta_2 ROE + \beta_3 ROA + \beta_4 RLI + \beta_5 DAC \quad (2)$$

where,

$h_0(t)$ is the reference hazard rate when the value of all predictor variables equals 0;

$\beta_{i=0,...,5}$ are the parameters of the regression model, which measures the influence of the predictor variables on the probability of non-going risk. In the study, non-going concern risk means that at a given point in time (in the period analysed), a firm may be aware of this event when the financial auditor makes a number of going concern observations in the audit report.

In order to estimate and test the influence of factors on the probability of going-concern, the Cox model is proposed in the study, corresponding to equations (1) and (2). This model allows the analysis of duration data, similar to regression models, but it is used to estimate the hazard rate, $h(t)$, i.e. the probability of knowing the event under study as a function of a linear combination of explanatory factors. (Robu *et al.*, 2012).

4. Results and discussions

The period analysed in this study starts in 2012, the year of mandatory application of IFRS in individual financial statements. Thus, the period does not include the crisis that started in 2008, the effects of which - predictably - led to an increase in references to going concern in audit reports as a result of the caution shown by auditors (Geiger *et al.*, 2014; Tsipouridou & Spathis, 2014; Beams & Yan, 2015; Mareque *et al.*, 2017; Read & Yezegel, 2018). This feature of our study means that auditors' opinions are not decisively influenced by the immediate effects of the crisis, except to the extent that the prudence they showed during the crisis was maintained on the long term. We can therefore attribute the difficulties in going-concern reported by auditors over the period 2012-2023 to factors other than the global crisis. However, we do have a crisis - the health crisis generated by covid-19 - and it is interesting to isolate, as far as possible, its effect on the auditors' opinions and comments, as well as on the KAM list included in the audit report.

In the sample analysed (875 observations), out of 190

modified opinions, only 56 (29.5%) refer to going concern matters. This percentage could be compared with data for the US market, reported by Foster & Shastri (2016), according to which, for those between 15,000 and 19,000 public firms, GCOs appeared between 14% and 20%; it should be noted that the share of GCOs is much higher for small firms and decreases significantly as firm size increases. Carson *et al.* (2012) report weights with the same trend for US firms over the period 2000-2010: from 36.70% for small firms to 0.33% for firms with market capitalizations above USD 500 million, for an average of 15.91%. Ruiz-Barbadillo *et al.* (2004), on a sample of Spanish firms, also find that the larger the customer, the less likely it is to receive GCO, even if objective circumstances would justify such a view.

For US firms that received GCO, the survival rate for the period 2000-2010 is 98.31% (Carson *et al.*, 2012), while of the firms that went bankrupt, 60.10% received GCO in the previous year.

Descriptive statistics on the financial indicators analysed as predictor variables of interest are presented in **Table no. 6.**

Table no. 6. Descriptive statistics on the financial indicators analyzed

Var		FL		ROA		ROE		ILR		DAC	
Year	N	Medie	Dev.std.	Medie	Dev.std.	Medie	Dev.std.	Medie	Dev.std.	Medie	Dev.std.
2012	77	0.1760	5.5255	0.0115	0.1034	0.2029	0.8747	1.1974	4.4387	-2.2913	13.1207
2013	75	0.2496	3.5842	0.0002	0.1195	0.0983	0.4302	0.9742	3.5786	0.1543	0.3293
2014	75	0.4140	3.3742	0.0257	0.1028	0.0573	0.3265	1.3509	3.9090	0.2147	0.4121
2015	75	2.4461	16.1099	0.0668	0.4113	-0.2467	1.7392	1.2851	3.5806	0.1738	1.6517
2016	75	-0.5724	7.0892	0.0147	0.1661	0.1848	1.2990	1.2416	3.1343	0.2550	0.2519
2017	73	-0.3678	4.2648	0.0480	0.2639	-0.0753	2.0857	1.0046	2.1056	0.2374	0.3597
2018	70	-0.9410	6.1230	0.0250	0.1818	0.9816	6.4398	1.0348	2.1548	0.2957	0.2464
2019	72	0.1622	2.4461	0.0413	0.1225	0.0753	0.1978	1.0719	2.3527	0.2850	0.1955
2020	69	1.2704	8.7874	0.0303	0.1110	0.0346	0.2533	1.3172	2.7583	0.1426	0.3339
2021	69	-6.5647	59.2438	0.0552	0.1723	0.5772	4.1893	1.0446	2.0960	0.2694	0.6606
2022	70	-0.0265	4.5034	0.0850	0.3507	0.1107	0.3842	1.2031	2.6502	0.3327	0.5400
2023	69	0.5011	1.8561	0.0509	0.1404	0.0839	0.2052	0.9267	1.4999	0.0914	0.9102
Total	875	-0.2410	17.9201	0.0374	0.2114	0.1706	2.3882	1.1384	2.9863	0.0000	4.0000

Source: own processing in SPSS 25.0

The data in **Table no. 6** shows that financial leverage (FL) averages -0.2410 across the sample analysed for the period 2012-2023, indicating negative equity as a result of losses carried forward. High values of leverage were recorded in the financial years 2015 and 2020, with supra-

unitary values of FL, indicating that the analysed firms are financed predominantly from foreign resources and less from own resources. Also, a high but negative FL value was recorded in financial year 2021, indicating very high

values of losses carried forward relative to debt in this period, probably justified by the covid crisis.

In terms of return on assets (ROA), at the level of the analysed sample, it can be observed that a firm registers on average ROA values of 0.0374, which implies that for every 100 active monetary units used in the operating activity, they will generate 3.74 monetary units in the form of future economic benefits.

For the return on equity (ROE), we observe that at the level of the analysed sample, a BVB listed firm registers on average ROE values of 0.1706. This implies that for every 100 monetary units of capital made available by the shareholders, they will be remunerated by dividends (as part of the net income) with 17.06 monetary units. Average negative values of this indicator, for the financial years 2015 and 2017, reflect the recording, on average, of net losses.

The immediate liquidity ratio (ILR - Cash Assets/Current Liabilities) records an average of 1.1384 in the sample analysed, which indicates the firm's ability to repay

immediately due debts instantly. It can be seen that in each period analysed, the immediate repayment capacity ratio is higher than 0.3, which is considered adequate.

For the indicator that measures the level of discretionary accruals, in absolute value, in relation to the operating income - *Abs(DAC)*, at the level of the analysed sample, it can be observed that, on average, a BSE listed firm registers values of this indicator of 0.0000. This value indicates a lack of discretionary accruals in relation to the value of the operating income. However, when analysing by year the discretionary accruals, in absolute value, in relation to the operating income, it can be observed that the highest values are recorded in the financial years 2016, 2018, 2019, 2021 and 2022, when the value of discretionary accruals represents more than 25% of the operating income.

Descriptive statistics on the financial indicators analysed by categories of auditors can be seen in **Table no. 7**.

Table no. 7. Descriptive statistics on financial indicators analysed by category of auditors				
Variable	Auditor category	N	Mean	Dev.std.
FL	B4	282	0.4302	2.2474
	NB4 International	178	-0.0581	7.3383
	NB4 Local	415	-0.7756	25.5124
	Total	875	-0.2410	17.9201
ROA	B4	282	0.0589	0.1864
	NB4 International	178	0.0361	0.2303
	NB4 Local	415	0.0233	0.2181
	Total	875	0.0374	0.2114
ROE	B4	282	0.0795	0.4096
	NB4 International	178	0.0351	1.4300
	NB4 Local	415	0.2906	3.3204
	Total	875	0.1706	2.3882
ILR	B4	282	1.3277	2.9612
	NB4 International	178	1.9457	4.3634
	NB4 Local	415	0.6634	2.0505
	Total	875	1.1384	2.9863
DAC	B4	282	-0.0704	3.1566
	NB4 International	178	0.2054	0.6002
	NB4 Local	415	-0.0411	5.1840
	Total	875	0.0000	4.0000

Source: own processing in SPSS 25.0

Table no. 7 shows that the firms audited by Big4 are generally characterized by: positive equity, being

favourably rated in terms of leverage (below average FL); for every 100 monetary units of assets used in operating

activities, they will generate 5.89 monetary units in the form of future economic benefits; for every 100 monetary units of capital made available by shareholders, they will be remunerated by dividends (as part of net income) with 7.95 monetary units; they have the ability to instantly repay immediately due debts, and the amount of

discretionary commitments represents only 7% of operating loss.

The distribution of the analysed sample according to the type of auditor and the occurrence of the studied event is presented in **Table no. 8**.

Table no. 8. Distribution of the analysed sample by type of auditor and occurrence of the event studied

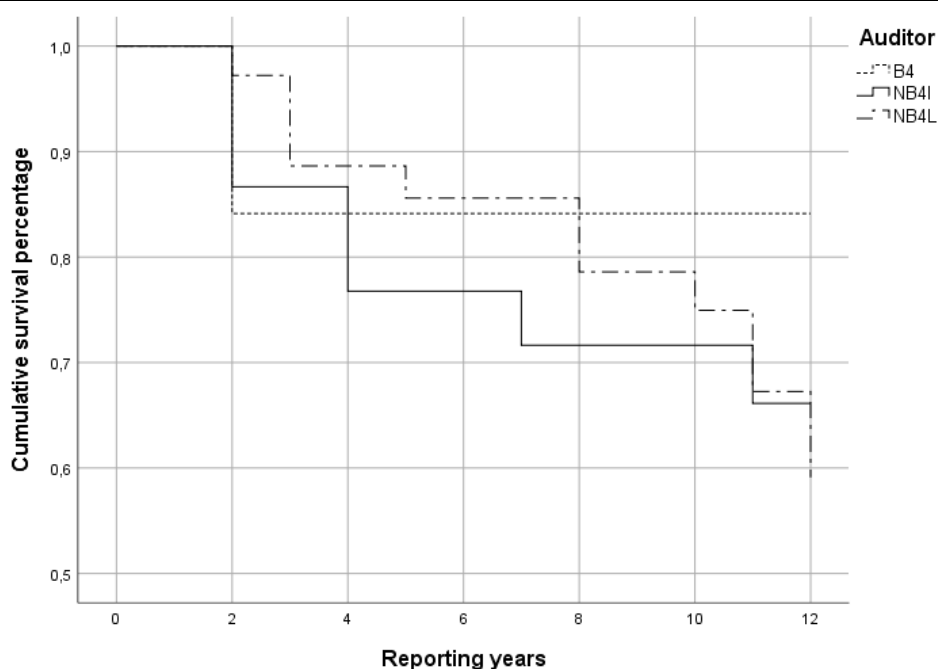
Category	Auditor Type	Individual firms with reported events (going concern problems)	Individual firms that did not experience the event (survived)	Survival rate (%)
1	B4	5	27	84.40%
2	NB4 International	7	16	69.60%
3	NB4 Local	12	23	65.70%
Total		24	66	73.30%

Source: own processing in SPSS 25.0

From the data presented in **Table no. 8**, we see that most of the firms that received going concern observations were audited by auditors from local NB4 (local audit firms), both in terms of number of cases (12 unique firms) and percentage (100% - 65.70% = 34.30%). They were followed by firms audited by auditors from international

NB4 (foreign audit firms), respectively 7 unique firms and a percentage of 30.40% (100% - 69.60%). In addition, the fewest cases of going concern were reported by firms audited by auditors from B4 (*Big 4*), i.e. 5 unique cases and 15.60% (100% - 84.40%). This may be explained by the fact that Big4 audits large firms, generally too big to fail.

Figure no. 1. Survival function of firms in the analyzed sample to the event studied (observations on going concern)



Source: own processing in SPSS 25.0

The distribution of the values of the survival functions, $h(t)$, by auditor type is shown in **Figure no. 1**, over the 12 years of reporting at the BSE, 2012-2023.

Figure no. 1 shows the survival functions for the firms in the analysed sample with respect to the knowledge of the event (the going concern observations in the audit report), the time interval at which this event was reported by the auditors, and the percentage of survival of this event (i.e. how many unique firms remained in the analysis after the going concern issues were reported).

For all firms analysed, going concern problems were reported after two years of reporting. At the same time, the

firms audited by Non Big 4 Local (NB4L) auditors show a much higher survival rate (i.e. a number of firms that did not experience the analysed event in time, relative to the number of firms analysed) than the firms audited by Big 4 (B4) and Non Big 4 International (NB4I) auditors.

For the analysed firms included in the sample, **Table no. 9** presents the information on the risk of occurrence of the event (problems in financial reporting related to going concern), the percentage of survival, over time, in relation to the number of firms, depending on whether the auditor belongs to the B4, NB4I or NB4L group of firms.

Table no. 9. Distribution of the sample of firms analysed by type of auditor and by reporting year in which they experienced and survived the event studied

Auditor Type		Number of years of reporting	Number of firms included in analysis	Number of firms removed from the sample	Number of firms who knew the event	Share of firms that knew the event	Share of firms that survived the event	Cumulative survival rate
(0)		(1)	(2)	(3)	(4)	(5) = (2)/4	(6)=1-(5)	(7)
Auditor	B4	0	32	0	0	0.00	1.00	1.00
		1	32	1	5	0.16	0.84	0.84
		2	26	1	0	0.00	1.00	0.84
		3	25	4	0	0.00	1.00	0.84
		4	21	1	0	0.00	1.00	0.84
		5	20	1	0	0.00	1.00	0.84
		6	19	0	0	0.00	1.00	0.84
		7	19	1	0	0.00	1.00	0.84
		8	18	1	0	0.00	1.00	0.84
		9	17	2	0	0.00	1.00	0.84
		10	15	0	0	0.00	1.00	0.84
		11	15	0	0	0.00	1.00	0.84
		12	15	15	0	0.00	1.00	0.84
	NB4I	0	23	0	0	0.00	1.00	1.00
		1	23	1	3	0.13	0.87	0.87
		2	19	1	0	0.00	1.00	0.87
		3	18	1	2	0.11	0.89	0.77
		4	15	0	0	0.00	1.00	0.77
		5	15	0	0	0.00	1.00	0.77
		6	15	0	1	0.07	0.93	0.72
		7	14	0	0	0.00	1.00	0.72
		8	14	1	0	0.00	1.00	0.72
		9	13	0	0	0.00	1.00	0.72
		10	13	0	1	0.08	0.92	0.66
		11	12	0	0	0.00	1.00	0.66
		12	12	12	0	0.00	1.00	0.66

NBFL	0	36	0	0	0.00	1.00	1.00
	1	36	0	1	0.03	0.97	0.97
	2	35	2	3	0.09	0.91	0.89
	3	30	1	0	0.00	1.00	0.89
	4	29	0	1	0.03	0.97	0.86
	5	28	1	0	0.00	1.00	0.86
	6	27	2	0	0.00	1.00	0.86
	7	25	1	2	0.08	0.92	0.79
	8	22	0	0	0.00	1.00	0.79
	9	22	1	1	0.05	0.95	0.75
	10	20	1	2	0.10	0.90	0.67
	11	17	1	2	0.12	0.88	0.59
	12	14	14	0	0.00	1.00	0.59

Source: own processing in SPSS 25.0

According to the data presented in **Table no. 9**, BSE listed firms audited by Big 4 auditors had the most going concern problems after the first reporting year (16%, from column 5). Subsequently, over the 12 reporting years, firms audited by NB4I and NB4L auditors had the most going concern issues raised by the auditors, with survival rates of 66% and 59% respectively. The number of firms removed from the sample over the 12 years of reporting refers to firms that no longer reported financial information by the time the event was known or the survey was completed.

In order to test the influence of determinants on the probability of occurrence over time of auditors' observations of going concern, the Cox regression model in equation (2) will be used in the study. The correlation coefficients between these variables are presented in **Table no. 10**.

Based on the estimated correlation coefficients, it can be concluded that there are significant causal links between the influence of leverage ratio (FL) and return on assets

(ROA) on the return on equity (ROE), as a signal indicator of going concern problems. At the same time, the link between DAC and the immediate liquidity ratio (ILR) indicates the existence of high discretionary accruals, i.e. possible earnings management operations, in highly liquid listed firms, with a direct impact on going concern.

Table no. 10. Coefficients of correlations between predictor variables included in the analysis

	FL	ROE	ROA	ILR
ROE	0.588			
ROA	0.022	0.646		
ILR	-0.158	-0.275	-0.303	
DAC	-0.097	-0.143	-0.140	0.528

Source: own processing in SPSS 25.0

The parameter estimates of the regression model for equation (2) are presented in **Table no. 11**.

Table no. 11. Parameter estimates of the regression models for equation (2)

Variable	B	SE	Wald	df	Sig.	Exp(B)
FL	-0,034	0,035	0,931	1	0,335	0,967
ROE	-0,030	0,043	0,484	1	0,487	0,970
ROA	-1,797	1,643	1,196	1	0,274	0,181
ILR	-0,835	0,537	2,415	1	0,120**	0,452
DAC	-0,126	0,055	5,386	1	0,020*	0,882

* significant values for a 15% risk; ** significant values for a 5% risk

Source: own processing in SPSS 25.0

In **Table no. 11** we see that the most significant influences on the probability of going concern issues reported in the audit reports over time are determined by DAC and RLI. Thus, at the firm level, the existence of discretionary accruals (in the form of differences between cash and accruals accounting) indicates the presence of possible earnings management operations with a direct impact on both the firm's liquidity and, more importantly, on the probability of being able to continue as a going concern within a foreseeable time horizon. In this line, reducing discretionary accruals will increase the probability over time that a firm will continue to operate, with the auditor expressing an unmodified opinion on whether the application of this principle is in accordance with IFRS. Furthermore, our findings are in line with results reported in other studies (Moalla, 2017; Bava & di Trana, 2019; Chan *et al.*, 2021; Xu *et al.*, 2018), which tested the influence of determinants on the likelihood of occurrence over time (since first-time adoption of IFRS) of auditor's observations on going concern issues mentioned in the audit report.

5. Conclusions

By analysing the situation of Romanian non-financial companies listed on the regulated market of the BSE, during the period of application of IFRS in their individual accounts (2012-2023), we aimed to estimate the probability of occurrence going concern difficulties, based on the observations found in the audit reports that refer to this element. We focused both on the modified opinions with reference to (non)going concern, as well as on what the auditors included in the emphasis of matter paragraphs or in the key audit matters part (the latter, only since 2016). From the literature, we found it most appropriate to hypothesize that the going concern difficulties for Romanian non-financial firms listed on the regulated market of the BSE (where IFRS is applied) is significantly influenced by operating and financial performance, as well as by the application of earnings management techniques. The variables used were processed by applying survival analysis based on Cox regression models.

The results of our analyses show that going concern problems were generally reported two years after such an issue was reported in the audit report. At the same time, companies audited by auditors from the Non Big 4 local group (NB4L) have a much higher survival rate (i.e. the

number of companies that did not experience the analysed event in time, compared to the number of companies analysed), compared to companies audited by auditors from the Big 4 (B4) and Non Big 4 international (NB4I).

We identified significant causality in the influence of leverage ratio (FL) and return on assets (ROA) on the return on equity (ROE), as a signalling indicator of going concern problems. At the same time, the link between discretionary accruals (DAC) and the immediate liquidity ratio (ILR) indicates the existence of high discretionary accruals, i.e. possible earnings management operations, in highly liquid listed firms, with a direct impact on going concern. The reduction in discretionary accruals over time increases the probability that a firm will continue as a going concern and the auditor express an unqualified opinion on whether the firm is in compliance with this principle under IFRS.

Limitations of the study result in particular from the limited sample size analysed, as well as from the lack of a robustness check of the data by applying alternative models to test the likelihood of firm survival. In future research, it might also be interesting to study the market reaction to the GCO (following Myers *et al.*, 2018) or to the presence of mentions of going concern in emphasis of matter paragraph or in the KAM. It is also useful to see the extent to which the issuance of an GCO by the auditor of Romanian firms leads to the auditor's change in the following year(s) (Lennox, 2000), as auditors may consider that the issuance of an GCO creates the risk of being replaced by dissatisfied clients who consider the GCO to be unjustified (Svanberg & Öhman, 2014). The Romanian audit market has not had to go through turning points such as the implementation of SOX in the USA (DeFond & Lennox, 2011); however, it is interesting to see to what extent the inclination of audit firms to express modified opinions (with or without GCOs) changes following events such as financial or health crises. The analysed population can be extended to other firms listed on the BVB (on the alternative AeRo market) and even, if information can be obtained, to other audited firms, i.e. state-owned firms, for example, or private firms that exceed the thresholds set by the regulations on financial auditing. Hardies *et al.* (2018), for example, obtain interesting results analysing such private (Belgian) firms.

To the extent that the information would be available, it is useful to analyse the link between GCO and the results of the audit firms' verification by the specific body (ASPAAAS,

CAFR), following the model proposed by Song & Ye (2014), for non-US audit firms expressing opinions for US firms that have been verified by the PCAOB (Public Company Accounting Oversight Board). The literature also suggests effects of ownership and trading of shares by members of the firm's management on the auditor's

opinion on going concern (Chen et al., 2013). Another research direction involving GCOs is to analyse the tone of discourse in the annual reports of Romanian firms, with the idea of testing how this tone is correlated with GCO risk, following the model proposed by Hossain et al., (2020).

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